THE IRON AGE

New York, June 10, 1920

ESTABLISHED 1855 VOL. 105: No. 24

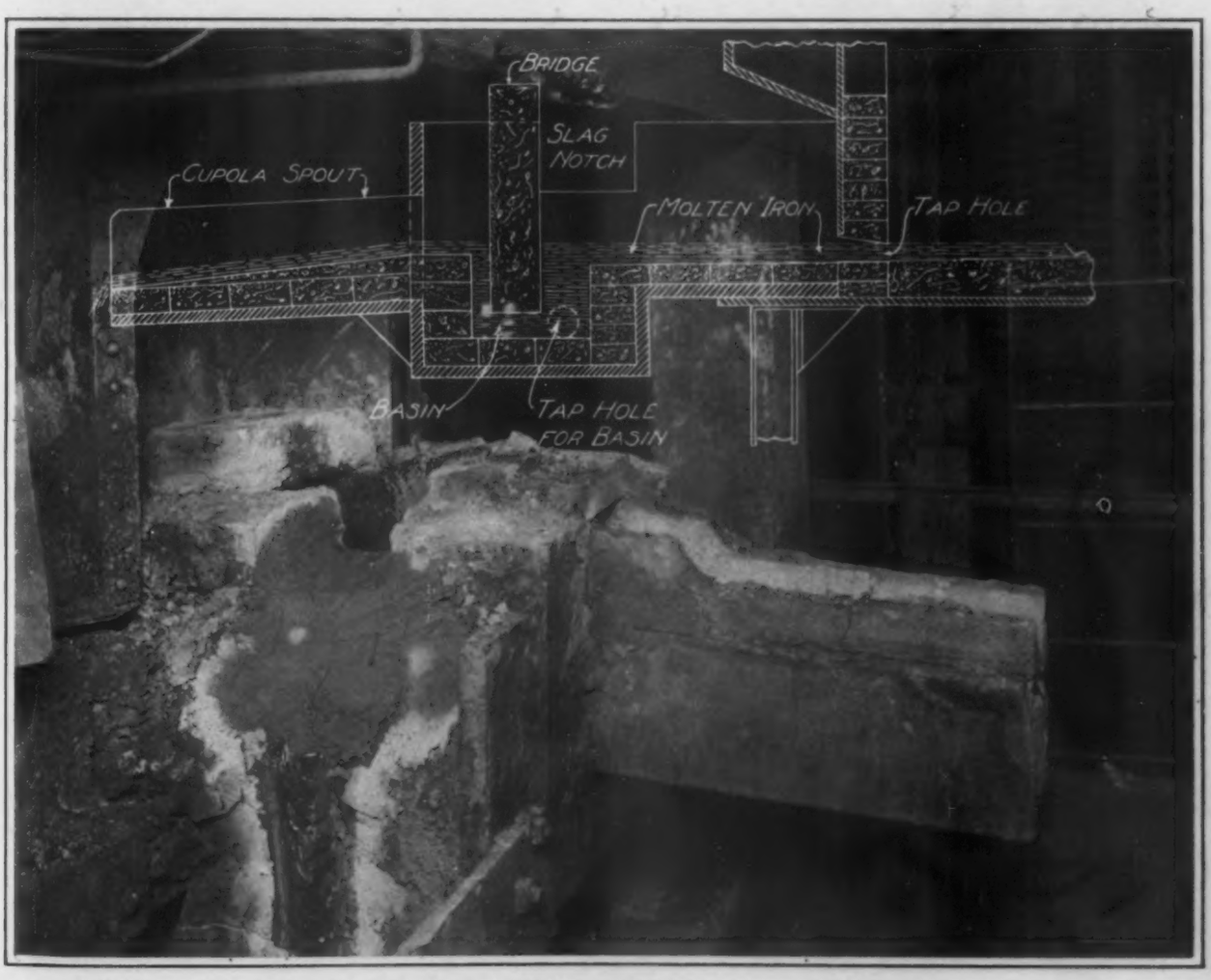
Cupola Designed to Save Time and Labor

Bottom Doors Operated by One Man—Container Receives Material Direct When Bottom Is Dropped —Clean Metal and Continuous Operation Attained

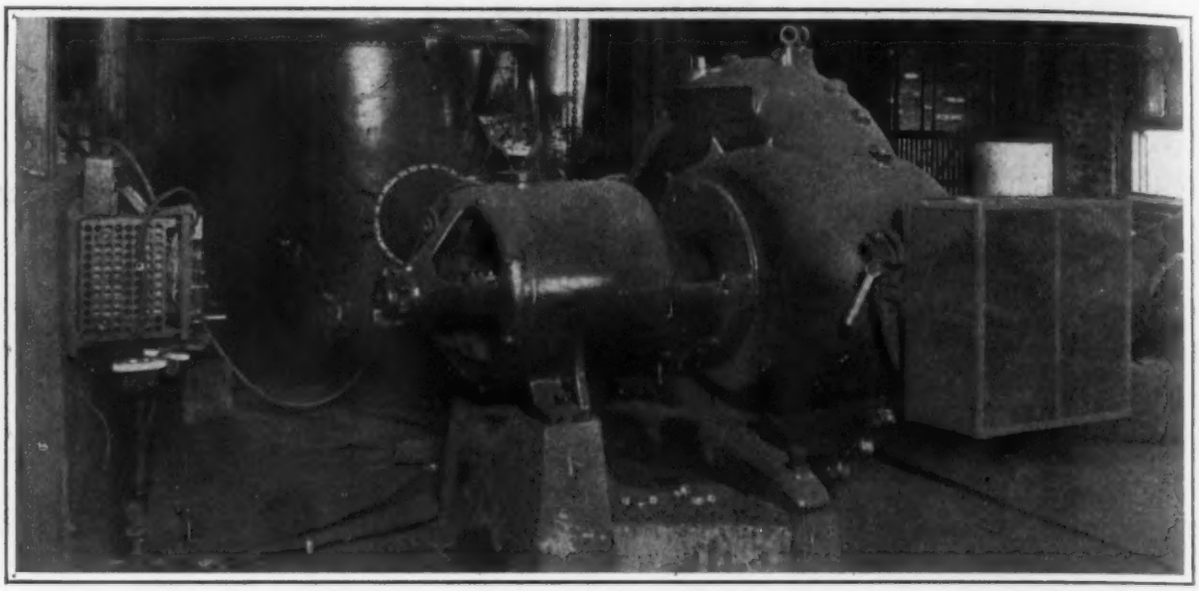
INSTALLATION of a new cupola, in connection with which a number of new features are incorporated, has recently been completed by the Modern Foundry Co., Oakley, Cincinnati. The improvements mean better mixed and cleaner metal, saving of time and effort by reducing to an absolute minimum the practice of "stopping in" so common to most foundries, securing of a continuous run of metal and saving of time and labor on the part of the employees of the plant.

The cupola is raised 10 ft. above the floor to enable a container to be run under it, so that when the bottom is dropped at the end of the day's run all the material in the furnace will drop directly into it. The container is then picked up on a lift truck and immediately taken away. This does away with the labor involved in clearing up the floor after the bottom doors are dropped and permits the empty furnace to cool in a shorter time.

A new method of lifting the bottom doors into place has also been installed and to show the amount of time and labor saved in this one operation, it may be mentioned that one man can now lift the bottom doors into place in about 3 min., where formerly 5 men were required, taking 20 min. The method used is a simple one. The bottom doors are equipped with rollers, and an eye bolt is inserted in the furnace hearth plate at one



Close Up View of the Slagging Spout, Showing Slag Notch and Slag Chamber Partly Open. When in operation slag flows through the notch to the trough, which is bolted to the spout



General Electric Centrifugal Compressor Unit Which Supplies the Blast. The chain hoist used to lift the bottom doors into place is immediately to the right of the cupola

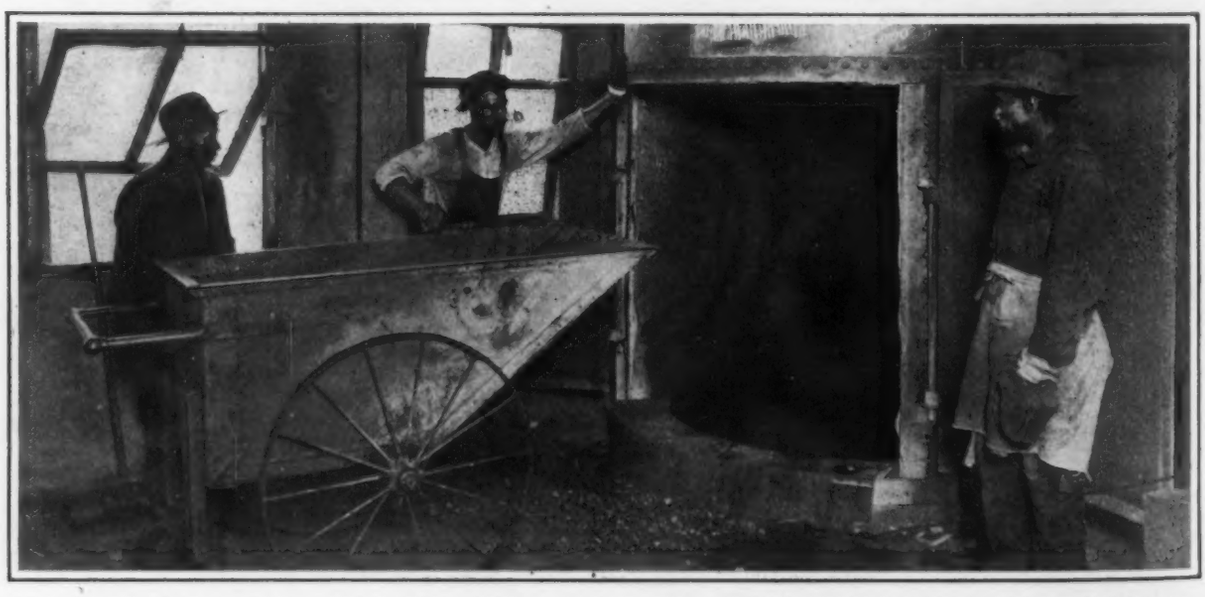
side of the doors. When the doors are to be raised a wire rope is passed over the rollers on the doors, and a hook on one end attached to the eye bolt. The other end is attached to a chain block, located on the compressor floor above, and in this way the doors are simultaneously hoisted into place, only one man being required.

The bottom doors are held in place by a pivot beam, and a prop suspended from the ceiling fits into a slot at the outer end of the beam, thus preventing the movement of the beam when the cupola is running. For safety purposes a 1-in. pin prevents this prop from moving out of its place. When it is desired to drop the bottom doors, an air hoist, shown in one of the accompanying illustrations, is used, the hook being attached to the U-bolt in the prop, the safety pin withdrawn and the air turned into the hoist. When the supporting prop is released from its position, the weight of the metal on the cupola bottom is sufficient to swing the pivot beam and thus allow the doors to open. As an additional safety measure when the furnace is running, the hook of the hoist is always disengaged from the supporting prop and the air hose leading to the hoist disconnected. The same workman is always assigned the task of operating the hoist and in this way the chances of the doors being dropped otherwise than by intention are eliminated.

Another feature of this installation is the methods employed for insuring practically continuous operation, and also the certainty of securing better mixed and cleaner metal. This is accomplished by the slagging spout and the mixing ladle placed in front of the cupola.

In order to operate the cupola continuously and thoroughly skim the molten metal, a slagging spout is used. When the furnace is tapped, molten metal flows into the basin. When the basin is filled, slag on top of the metal is held back by the bridge, and flows off through the slag notch on the side of the spout. While the furnace is in operation the top of the slag chamber is covered with a flat fire brick tile. It will be apparent that it is practically impossible for the slag, resting as it does on top of the metal, to pass the bridge, into the mixing ladle. At the end of the heat the metal basin is tapped through a hole in the side and drained off, ready for the next day's work.

The mixing ladle, electrically operated, is placed directly in front of the cupola and is controlled by the operator from the platform above. This ladle has a teapot spout, and the same idea of a brick dam as carried out in the slagging spout is



The Bottom of the Charging Door Is 8 In. Above the Floor. The specially constructed buggy takes a full charge of coke and dumps directly into the cupola

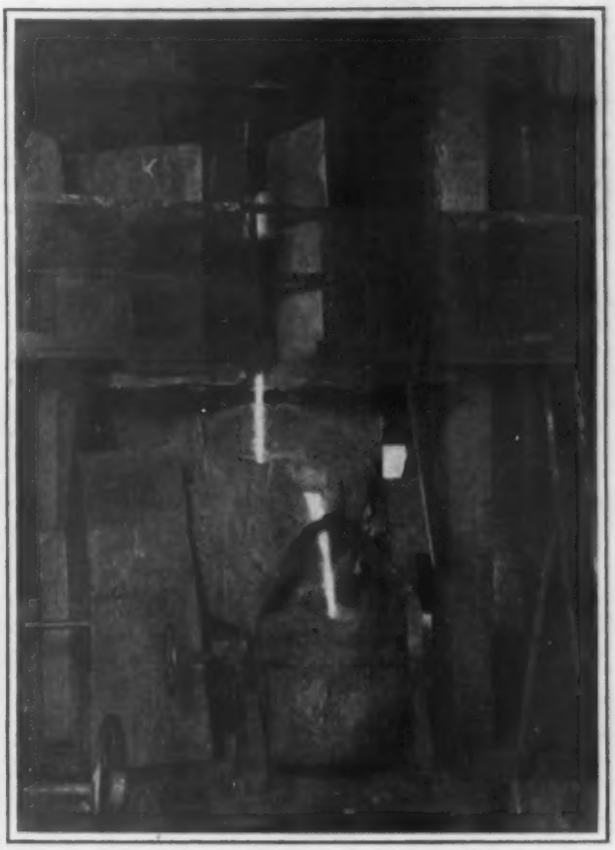
also used here. When the metal is being poured, the ladle usually contains from 4000 to 5000 lb. of iron, and has a capacity of 3 tons. The use of this ladle insures continuous operation as it is not necessary to "stop in" when ladles are being changed. It is only necessary that the operator tilt the mixing ladle back and the extra capacity easily takes care of the flow of metal from the cupola. Since the mixing ladle at all times contains molten metal equivalent to one complete charge, the proper chemical mixture is assured in the foundry ladles.

The charging door is lowered to within 8 in.

Pivoted Beam Supporting Cupola Doors. The prop shown is hinged to the ceiling and rests in the socket. The pin prevents the prop from slipping. When doors are to be dropped the pin is withdrawn, the hook of the air hoist inserted in the U-bolt in the prop and hose connected. The cable shown is for the purpose of raising the doors simultaneously

of the floor. This does away with the necessity of workmen having to lift pig iron and heavy scrap. Raw materials are placed on platforms at stock piles, then picked up by electrically operated lift trucks with scale attachment for weighing and conveyed to the charging floor. By the use of these trucks and platforms, handling of material by hand is reduced to a minimum. A specially constructed buggy, which takes a full charge of coke and dumps it directly into the cupola, is used. Two large automatically operated elevators are used as part of the charging platform, which is very compact. In order to insure proper charging it is necessary to use the hand method as the standards are unusually severe.

To equalize the blast pressure at the tuyere openings a special wind box is installed on this furnace. It is twice as high as the ordinary box and divided horizontally into two equal sections by a steel plate. The blast comes into the upper compartment directly from the compressor, and finds its way to the lower compartment, which connects directly to the tuyeres through six equally spaced holes in the dividing plate. Zippler tuyeres are used. A General Electric centrifugal compressor with a speed of 3450 r.p.m., is used.



Mixing Ladle in Tilted Position, Receiving Iron from the Cupola and Discharging Into the Foundry Ladle

The cupola was built by the J. W. Paxson Co., Philadelphia, and was erected under the supervision of A. N. Kelley, superintendent of the Modern Foundry, who is responsible for the installation. So efficient has this installation proved that the other cupola is now being similarly equipped.

The Container Into Which the Bottom Is Dropped, and Also in Which Slag Is Received. The slag trough is on the left

Operating Data on Large Shovels

Records made in excavating the Queenstown-Chippewas power canal by the Hydro-Electric Power Commission of Canada have fully shown the value of large electric shovels, according to L. C. McClure, industrial department Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Over 20,000 cu. yd. of earth and rock is removed daily in digging this canal, mainly accomplished by three 8-cu. yd. electric shovels.

The operating economies were found by making a thorough test on shovel No. 1. This Bucyrus shovel is of 300 ton weight, has a 90-ft. boom, uses either 5, 6, or 8 cu. yd. buckets and works on a 50 to 50-second cycle. There are four Westinghouse 440-volt 3-phase 25-cycle motors in this shovel used as follows: Two 25-hp. for hoist, one 150-hp. for thrust and one 150-hp. for swing. The controllers are of the master-switch, magnetic type and the whole operating is handled by two men. This shovel was working 90 ft. below the surface and loading material on cars approximately 70 ft. above their own base. The power for each cu.

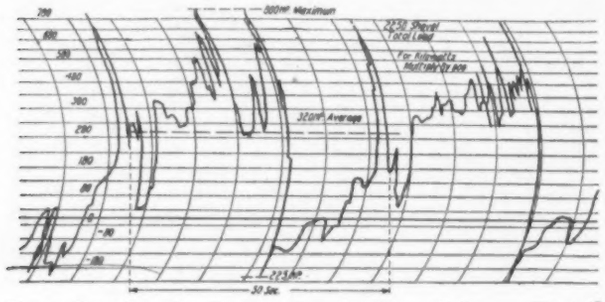


Chart Showing the Energy Consumption of Large Electric Shovel

yd. dug, lifted and loaded into a car was approximately 0.8 kw.-hr.

The graphic chart shows the energy consumption under actual working conditions. Fifty seconds were required to make the entire cycle, and during this period a maximum power demand of 800 hp. was reached. The average was 320 hp. for the entire cycle.

An interesting feature of the operation of these shovels is the fact that regenerative braking is utilized whenever possible. In this particular instance it is used when the shovel is lowered the 70 ft. after it has been raised that distance in order to load the cars. This is accomplished as follows: When the operator is ready for the bucket to come down, the motors are connected to the power supply and the bucket falls with the motors running at slightly above synchronous speed. When such a condition is reached, the motors operate as induction generators. Although as can be seen from the curve, some energy is generated and pumped back into the line, this item is not the main feature of this operation. This method of lowering saves mechanical wear as the brakes are required only for stopping and holding the bucket, requiring less repair work and making the equipment more reliable.

Results of Test on Large Electric Shovel

	Total Yards	Kw.-Hr.	Kw.-Hr. Per Yard
Whole test	24,406.5	20,436.0	0.826
Day work only	15,380.0	12,216.0	0.794
Day and night	9,326.5	8,220.0	0.882

Anti-Strike Bill Not Dead

WASHINGTON, June 8.—When Congress reconvenes it will give further consideration to the question of anti-strike legislation. The Poindexter bill, prohibiting interference with commerce by strikes, which was the subject of hearings before the Senate Committee on Interstate Commerce recently, has reached the Senate calendar and presumably will be pressed at the next session. The bill when originally introduced was aimed to apply to all those "employed in any capacity in the production, care, maintenance, or operation of any means or agency of such commerce." It was intended that the act would apply as well to industries engaged in the production of cars, locomotives, necessary fuel, and other means and agencies of transportation. The committee, however, restricted the operation of the first section of the bill to the officers and employees of carriers subject to the act to regulate commerce, for the reason that to them only had means been provided for the adjustment of industrial disputes by an official tribunal of the Government. The first section of the bill provides a fine of not exceeding $10,000, or imprisonment of not exceeding 10 years upon whomever advises or attempts to persuade persons employed by carriers to obstruct, delay, hinder, or prevent the movement of commodities. Section 2, which is not limited to employees of carriers subject to the act to regulate commerce, but applies as well to employees of related industries, prohibits obstructing or hindering the movement of commodities by force or violence or by threats or menace of any kind. The first section applies only to peaceable efforts to tie up transportation.

The coastwise steamship lines, which are under the jurisdiction of the Interstate Commerce Commission, would be affected by the anti-strike bill. Shipping men who appeared before the committee estimated that from Jan. 1, 1918, down to the present time the strikes in coastwise shipping lines have cost the public $85,959,976.69. This includes interest on the investment of the shippers in the commerce tied up, at 6 per cent, $12,800,000; interest on the investment of the carriers in interstate commerce facilities, $2,478,000; loss of revenue to the carriers, $18,426,976.69; loss in wages to the strikers themselves and others rendered idle by the strike, $12,255,000; and loss due to confusion, delay, congestion and destruction of perishable freight, $40,000,000.

Decision Against Iron Company

WASHINGTON, June 8.—The Supreme Court has rendered a decision holding that the Pennsylvania Railroad Co. is entitled to recover $1,209 in demurrage charges on 227 cars of iron ore belonging to the Kittaning Iron & Steel Mfg. Co. The court reversed a decision of the Supreme Court of Pennsylvania. The ore was frozen in shipment, and the company contended that it could not have unloaded the cars within the period of 48 hours free time allowed, and under demurrage code demurrage charges could not be legally assessed against the shippers. The Pennsylvania Railroad contended that if each car was considered separately, it could have been unloaded within the free time allowed.

The proceedings of the National Safety Council at its eighth annual safety congress at Cleveland early in October, 1919, have been compiled in a paper-covered book of 1457 pages and may be secured from headquarters, 168 North Michigan Avenue, Chicago. Among the contents are discussions of workmen's inspection committees by representatives of the Carnegie Steel Co., the Cambria Steel Co., the American Steel & Wire Co., and the Bethlehem Steel Co. Among the other companies in metal-working and allied lines represented in the program were: The Norton Co., Worcester, Mass.; the American Rolling Mill Co., the National Malleable Castings Co., the Rockford Malleable Iron Works, Rockford, Ill.; the Marion Gray Iron Foundry, Marion, Ind.; the Detroit Steel Casting Co. and the Interstate Iron & Steel Co., Chicago.

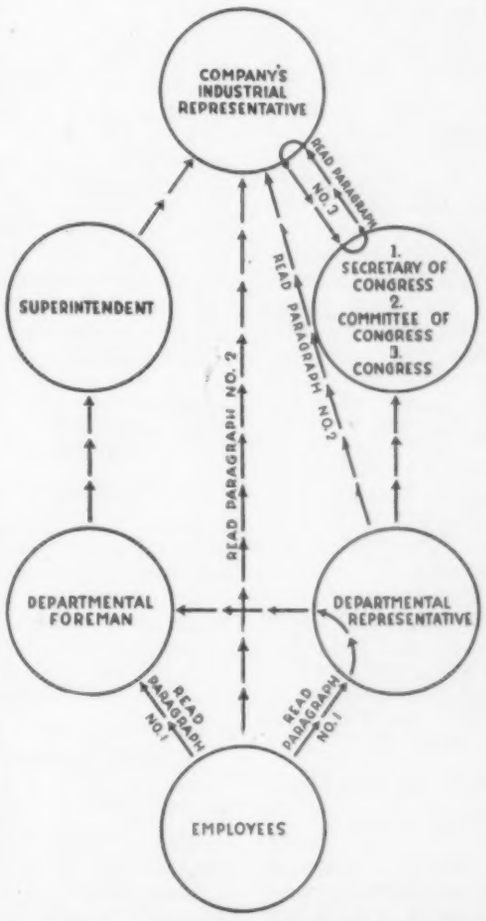
Steel mill electrical repair shop practice was discussed by A. J. Standing, superintendent electric department Saucon Plant, Bethlehem Steel Co., South Bethlehem, Pa., at a meeting of the Philadelphia section of the Association of Iron and Steel Electrical Engineers, 513 Empire Building, Pittsburgh. The speaker outlined the policies which should govern the use of one large central repair shop, or the use of a somewhat smaller central repair shop, together with several small local repair shops in isolated parts of the mills. Electrical organization, record systems for motors, cranes and repair work, as well as safety and welfare of employees, were discussed in detail.

Workmen's Congress Solves Wage Problem

How the Principles of Industrial Democracy Have Worked Out on the Representative Plan at the Works of the Reliable Stove Co.

AN interesting example of the actual application of the principles of industrial democracy in shop management is found in the plant of the Reliable Stove Co., Cleveland, a branch of the American Stove Co. The employees of this company have had a voice in its management only about three months, but during that time have developed as a constructive factor in the operation of the plant and have solved the most important problem that comes up in the relations of the employer and employee, that of wage adjustment. With the authority conferred upon it, the company's employees' congress, through its wage and rate committee, tackled the wage question and in doing so apparently attempted to provide a new wage scale that would be fair to the company as well as to the employees. This wage scale, providing substantial increase in wages, was approved by the final authority, the cabinet, in the person of the plant manager, and has been placed in effect.

The way the wage advance was brought about was a refreshing departure from the plan often resorted to by labor unions, of making unreasonable demands often with a view of accepting a compromise, threats, disturbances and possibly a strike. In connection with the establishment of the new wage scale, it is interesting to note that the men, through the congress, provided a plan for classifying employees according to their efficiency, thus departing from the usual labor union rule that every man should be paid the same day rate for the same kind of work.



Alternative Sources of Appeal by Employees in Person or Through Their Departmental Representatives for Adjustment of Grievances.

The question of adopting a form of industrial democracy in order to provide representation of the employees in the management of the plant was submitted to the men last December and 287 out of 341 employees approved the plan, or 84 per cent of the total number. The plan as adopted is generally similar to that of other companies that have recently applied democracy to shop management. There is a congress composed of 12 members, six of whom are elected by the employees and six are appointed by the plant manager. The three that receive the highest number of votes act as a committee to confer with the plant manager on the appointment of the six chosen by the manager. Foremen are not eligible to candidacy.

Membership is limited to American citizens over 21 years of age who have been employees of the company at least a year. Female employees are given equal rights to serve in the congress, but the female membership is limited to one-fourth of the total number. The congress elects one of its members as chairman and the company's industrial representative appoints the secretary. One-half of the congressmen are elected for one year and the remainder for two years, but beginning with the second election the term of office is for one year. The same rule applies to the appointed members. Three-quarters of the members constitute a quorum and a majority vote of the members present is necessary to pass on a measure.

It is the duty of the employees' congress to make suggestions pertaining to all phases of management directly affecting the employees. The congress is split up by the chairman into committees, each committee being charged with the responsibility of matters relating to its particular subject. There are committees on such subjects as employment and discharge, health, sanitation and safety, wages and rates, economics and suggestions. In each department there is elected by ballot an employee whose duty it is to gather material for the congress and interpret rulings of the congress to employees of that department. These representatives are chosen from the members of the department eligible to vote and do not have a vote in the congress but have the right to appear before any committee of the congress.

The congress holds regular monthly meetings after working hours so that all employees may attend the sessions, and special meetings may be called at any time the chairman deems it necessary. Committee meetings are held as frequently as necessary, taking place in the company's assembly room. The right to vote for candidates for election to the congress is held equally by male and female employees, but no employee has a right to vote who has not been employed by the company for at least 90 days.

A congressman may be recalled when it is found he no longer represents his constituents or is out of harmony with the work of the congress. A petition setting forth his faults whether of commission or omission, must be signed by 25 per cent of the employees entitled to a vote and presented to the congress which shall then appoint a committee to investigate the case and if, in its opinion, the charges are justified, the committee shall order a vote taken. If 60 per cent of all employees voting concur in the verdict, the congressman is recalled and his successor elected. A representative may be similarly recalled if 25 per cent of the voting members of the department petition congress and if 50 per cent of the employees of his department vote for his recall.

In addition to the employees' congress, there is a senate whose duty is to work with the congress in the preparation of such measures as affect the company's policies and plan of management. This senate consists of heads of departments and the company's industrial representative, who acts as chairman without vote except in case of a tie, and at present has seven members. It is the duty of the senate to pass on such measures as the employees' congress shall present for approval. In case of approval by the senate, the measure approved is passed through the industrial repre-

sentative to the plant manager for the final action of the cabinet before becoming a company policy. In the event of disapproval, the senate must present suggestions that will put the measure in acceptable shape. Three-quarters of the membership of the senate shall constitute a quorum and the majority of votes present is necessary to approve or disapprove. Approval by the senate constitutes indorsement only, as the final approval of the cabinet is necessary to put any approved measure into effect. In case the employees' congress and senate are unable to agree on the measure, the chairman of the respective bodies each appoints three members to act as a joint committee for the purpose of bringing the disputed measure to such form as will be acceptable to both bodies. Meetings of the senate are held at least once a month.

A measure becomes a company policy by being adopted by the congress and senate, and approved by the cabinet. The organization plan provides that the cabinet shall consist of the plant manager and other company executives, with final authority on such matters as come within the authority invested in them by the board of directors. However, the plant manager is acting alone as the cabinet. The American Stove Co. has two other plants in Cleveland, each operated by individual units and it is the intention, should the plant management plan be adopted by the other plants, to have a cabinet composed of the managers of the three plants.

A supreme court is also provided for the purpose of acting as a final court of appeals or to interpret the articles of agreement between the company and its employees. This consists of nine members, three chosen from the congress, three from the senate and three from the cabinet. This court elects its own chairman but has no vote except in case of a tie. Either the congress or senate may impeach one of its members. To obtain a conviction, it is necessary that two-thirds of the members shall concur in the verdict. Conviction carries with it only expulsion from office, although the person expelled is required to show a reason why his conduct is not reason also for his dismissal from the employ of the company.

At the first meeting of the congress, two committees of five members each were appointed, one of wages and rates and the other on employment and discharge. The congress at the same meeting also voted in favor of classifying, rating and paying all men according to their ability. It also went on record in favor of piece work prices wherever possible and practical.

Committees Recommend Wages and Rates

The wage and rate committee decided to divide all employees of the plant into two general classes known as tradesmen and non-tradesmen. The non-tradesmen were classified as car loaders and unloaders, truckers and helpers and common laborers, with a minimum and a maximum pay for each class. Tradesmen were sub-divided into 23 classes. Three ratings were given the majority of the trades but some were given only two ratings; and the committee specified that there should be a minimum and a maximum pay for each rating. This rating of skilled employees in three classes is made according to the abilities of the men. The rating is done by the wage and rate committee with the assistance of the man's foreman and the department representative. The man is called before them, questioned, and the plan is explained to him before he is given a rating.

The wage and rate committee recommended that, to avoid difficulty after piece work prices have been established, set-up men be employed to prepare machines to receive work when it is necessary to set up dies, tools, jigs, etc., before operation can start. It had been the usual practice for piece workers to set up their machines and they were allowed a certain time at the day rate for this work. The committee deemed it advisable to eliminate this practice and to employ specially trained set-up men, believing that this policy would result in the elimination of disputes regarding piece work prices and would also speed up production.

In order to decide what recommendations it should make on the question of wages, the wage and rate committee appointed a special committee of two to visit other plants, and this committee, after being provided with letters of introduction which gave it access to plants and their payrolls, visited ten Cleveland factories which do work of similar character, including stove manufacturing plants and machine shops, and made a report to the committee of the earnings of the men in these plants with a comparison of the rates paid in their own plant. The committee found that wages paid in their plant compared favorably with those in other plants, with some exceptions, in which cases readjustments were recommended.

Following this investigation of the special committee, the wage and rate committee submitted a new schedule of hourly rates to the congress. This schedule provided an average advance of 11 per cent in rates. Some rates were left about where they were and others were advanced about 20 per cent. The congress approved the report after making two changes. The matter was then passed on to the senate, which increased some rates and reduced others, but made a slight average increase. The wage scale as amended by the senate was approved by the congress, then sent back to the senate, where it was adopted and then passed on to the plant manager who, acting as the cabinet, approved it, thus placing it into effect.

One subject taken up by the congress was that of working hours. The plant had been operating on a 9-hr. basis, and a motion that 9 hr. should constitute a day's work was adopted. The congress also decided that men on an hourly basis should be paid time and a half for overtime, and that piece workers should receive only the same rate for overtime as during regular hours. The differential in favor of the former was made because piece workers are able to earn a larger rate of pay in their regular working hours than the men on the hourly basis.

Adjustment of Grievances

Alternative channels are provided through which employees can appeal in person or through their department representative for adjustment of grievances. These are outlined in a pamphlet distributed among the men which also contains a diagram clearly illustrating the various channels through which employees may present their grievances. The paragraphs referred to on the diagram read as follows:

1. *Complaints and grievances to be taken up first with foreman and superintendent.*

Before presenting any grievance to the company's industrial representative, employees shall first seek to have differences or the conditions complained about, adjusted by conference in person or through their departmental representatives with the department foreman, who, in the event of being unable to make a satisfactory adjustment, shall see that the matter is properly presented to the superintendent.

2. *Investigation of grievances by the company's industrial representative.*

Employees believing themselves subjected to unfair conditions or treatment, and having failed to secure satisfactory adjustment of same through the foreman and superintendent, may present their grievances to the company's industrial representative either in person or through their regularly elected departmental representative, and it shall be the duty of the company's industrial representative to look into the matter immediately and seek to adjust the grievance.

3. *Reference of differences to proper committee of congress.*

When the company's industrial representative fails to adjust a difference satisfactorily, upon the request of the secretary of congress, or upon the initiative of the company's industrial representative himself, the difference shall be referred to the proper committee of congress for consideration and further action. . . . To entitle an employee to the consideration of his appeal by any committee of congress, the right to appeal must be exercised within a period of two weeks after the decision of the company's industrial representative.

In carrying out their general plan of industrial democracy, the company in co-operation with its employees has adopted a "Square Deal" creed of seven points under which both the company and the em-

ployees aim to be guided in their relations with each other. This creed is as follows:

1. We believe in a "Square Deal" on the part of the management and workers, one toward the other and both toward the community.

2. We believe that the principal desires of the management and workers are identical, namely—happiness; that the basis of happiness is health, progress, opportunity and prosperity.

3. We believe industry is the most important factor in determining the basis of happiness, and must recognize that men are men, something more than mere machines, more than money—recognition being the basis of self-respect.

4. We believe the management should give just returns for the work performed, to provide opportunity to learn and grow, to establish clean, orderly, safe and sanitary working conditions, proper equipment, reasonable hours and opportunities for recreation and rest.

5. We believe workers should give honestly applied energy, constructive thought to reduction of costs and highest quality of product, regular and dependable service, assume responsibility for indolence, indifference, restriction of output and poor workmanship.

6. We believe workers should be loyal and enthusiastic, should boost for their company, product, management and fellow workers.

7. We believe management and workers, comprising industry, will effect better mutual and community happiness by co-operation, stimulated through representation—the principle of democracy—A Square Deal.

Electrodes for Iron and Steel Furnaces

Comparison of Carbon and Graphite—Question of Metallic Electrodes—Cooling Collars and Carbon Consumption

BY C. H. VOM BAUR*

CARBON, in either the amorphous or graphite form, is the only material which answers at all as electrodes for steel and iron electric melting and refining furnaces. Often the question is asked why electrodes made of the material being treated cannot be used. This has been done, but not with success, for the electric arc furnishes the highest temperature known, estimated at 3500 deg. C, or more than twice the melting point of iron. Water cooling of the interior of an iron electrode was suggested by Siemens over 40 years ago, but this has scarcely been tried since, as it is apparent such a combination would be of only momentary service caused by the danger of burning away of the iron electrode. The consequent release of the water on the bath would be, while not disastrous, hardly auspicious. So the iron electrode has not been used, except here and there by an amateur, even though it has better electrical conductance and greater strength than electrodes made of any carbon material.

The one reason, therefore, for the exclusive use today of carbon as the electrode material for these furnaces is its high point of oxidation, which exceeds even the temperature of the arc itself and the fact that it is worn away, therefore, only by oxidation. Carbon in some form, therefore, having been chosen, the controversy promises to exist as long as the arc furnaces themselves, whether the amorphous or the graphitic form best suits the conditions imposed upon it. From the theoretical point of view this was discoursed upon at length 10 years ago by Hering and Hansen, before very much comparative practical information was available. Since 200 electric furnaces in this country alone have been placed in operation during the past two or three years, the decision to use either one or the other is based more on empirical data than otherwise.

Electrodes should be strong, possess good electrical and thermal characteristics giving low operating costs, not easily oxidizable, of nearly exact diameters, joints easily made and broken joints easily re-threaded. With furnaces having more than one electrode, they should be chosen of such a diameter and material that the pools of molten metal made from cold material run together quickly, considering the furnace design and the secondary voltage.

Amorphous carbon electrodes are stronger per unit of area in the transverse test than the graphite by 50 per cent or more. For the same current carrying capacity they are usually twice the diameter and consequently resist the shock of a tool or scrap and pig thrown against it, or the lunging of material against it as it melts much better, though with careful operation these accidents do not often occur. The threads give way or the joints break mostly for other than these reasons. Great care must be exercised when making a joint for the amorphouselectrode, using carbon paste whereas the graphite joint goes together alone with success. If when dephosphorizing, or under other oxidizing conditions, such as leaky doors and cooling collars, the electrode wears away unduly, the carbon, although attacked more easily by these oxidizing conditions, has a much thicker wall before the thread is reached simply because it is larger.

Both kinds of electrodes break off and fall into the furnace, whether equally often is a much disputed point and one on which many have often reversed their opinion, including the writer. The smaller diameter electrode piece, even though longer, can usually be more easily removed with tongs, etc., than the larger diameter piece. The graphite can also be very easily machined with comparatively cheap equipment. This is usually done by all companies using them, whereas the re-threading of the larger diameter carbon electrodes emphasizes an expensive equipment, much care in doing it, and is only being done by a few users.

Cooling Collars

Much has been done to improve the cooling collar so that the electrode consumption would only register the amount necessary for the work it actually accomplished, and not that due to neglected conditions, such as leaky doors, loose fitting and too short cooling collars. The collars should not be over ¼ in. (6 mm.) to ⅜ in. (9 mm.) larger in diameter than the electrode and of a height less than the diameter of the electrode. To keep air and gases from leaking around them, many mechanical and even telescopic air chambers have been applied which, though meritorious, are rather complicated for the rough treatment an electric furnace usually gets. Hence to keep this sliding fit tight, all that is really necessary is a cooling collar having a flat top so that an adequate quantity of wet slag material or clay can be placed against

*Engineer, Park Row Building, New York.

the electrode and kept there, which is the all-important item. Some collars have a narrower interior diameter half way down, causing them to hug the electrode more closely. Here wet clay material makes the sliding fit easier and better.

Just which electrode costs the least per ton of metal melted and for refining is something which each operator must determine for himself. Sometimes by changing over from one to the other, remarkable savings are shown, not only in this item but in the quicker heats and less electricity used per ton of output. The smallest (¼ to ½-ton) and the largest (20 to 30-ton) furnaces use graphite electrodes almost exclusively, whereas the intermediate sizes lean first to the one and then to the other, depending on the design. Many 6-ton furnaces use carbon electrodes, whereas other designs of the same size use graphite.

Effect of Raising the Roof

It is a decided mistake to raise the roof decidedly in order to have it last a little longer when pouring a very hot steel, because it not only increases the electrode consumption, but cuts down the tonnage and decreases the thermal efficiency generally. A good simple automatic control often lessens the electrode consumption because it improves conditions generally compared to the best hand control. Less breakage is apt to occur, and as breakages are the bête noir of the electric furnace operator, adequate means should be at hand for salvaging the broken pieces and using them over again as already mentioned. If electrodes are round enough, they should slip through a ring only 2 per cent larger. Sometimes the holder is out of repair, such as current going through steel hinges, instead of a copper shunt, which has been neglected, thus heating the holder and in turn the electrode, where it would normally be comparatively cool, especially with tight-fitting cooling collars as mentioned. A daily cleaning of these holders with compressed air is of much help, even the indirect psychological effect it has on all the furnace operators. Electrode consumption with these furnaces has been known to decrease in a remarkable manner, as soon as the operators could enjoy part of the saving.

Converted to Iron Foundry

The Standard Process Steel Corporation, Phillipsburg, N. J., has been reorganized. New equipment has been added and practically the entire plant will be given over to the manufacture of large and small gray iron castings on molding machines. Ralph Sleicher, Troy, N. Y., has been appointed general manager of the foundry. He was for a number of years with the West Side Foundry in Troy.

The sale of the entire output of the plant has been placed in the hands of the J. W. Sanders Co., 30 Church Street, New York, as agent.

Opportunities for the use of electric machinery in handling various materials were discussed by Zenas W. Carter, manager the Material Handling Machinery Manufacturers' Association, New York, in a paper, "Electric Machinery for All Handling—An Opportunity," presented at the convention of the National Electric Light Association, Pasadena, Cal., May 18. Copies of the paper can doubtless be had by addressing the National Electric Light Association, 29 West Thirty-ninth Street, New York.

The article on new courses in metallurgy as established by the Michigan Agricultural College, East Lansing, Mich., was written by W. G. Hildorf, in charge of this work. Prof. H. B. Dirks is head of the division of engineering of the college.

Plant and Plans of Newton Steel Co.

The first product was recently shipped from the plant of the Newton Steel Co. at Newton Falls, Trumbull county, Ohio, which commenced operations early in April. The plant consists of eight stands of roughing mills and eight stands of finishing mills, with an annual production capacity of 50,000 tons. The mills are entirely electrically driven and so constructed that additions may be made efficiently, as warranted. The product is chiefly high grade sheets, especially adapted for automobile body construction, for steel furniture, Pullman cars and the like. Principal markets of the company will be Philadelphia, Cleveland, Toledo, Detroit, Chicago and Cleveland.

The plant is located along the Mahoning river, on a 150-acre site. It is the first to get use of water from the Milton reservoir, a large artificial basin created several miles above Newton Falls by the city of Youngstown, Ohio, to insure an adequate water supply for the steel plants of the Mahoning Valley during the summer months.

The plant is served by the New York Central and the main line and a branch of the Baltimore & Ohio. It has over one mile of sidings. Because of its location the company enjoys rate advantages on sheet bar, its principal raw material, and coal. It is the first steel company to locate at Newton Falls. The company plans to conduct a store to sell small supplies to employees at cost, and to serve meals within the plant on the same basis.

The company has advantageous contracts with coal producers having mines only 25 to 40 miles west of its plant. Fuel shipments may therefore be facilitated, inasmuch as they do not pass through heavily congested centers. By means of a powdered coal installation, powdered coal is used under the boilers and for the sheet, pair and annealing furnaces. The company has long time contracts covering its sheet bar requirements satisfactory as to price and delivery, and the same applies to its acid requirements.

The Newton Steel Co. is capitalized at $3,000,000, represented by $2,000,000 of common and $1,000,000 of preferred. Of the common $1,350,000 has been issued and is fully paid in. Of the preferred $705,000 has been issued, a large part of which has been subscribed. An issue of $650,000 preferred is being sold to provide adequate funds for working capital and business extension. A condensed balance sheet issued to stockholders shows total assets of $2,082,500, including $1,306,964.88 in plant investment.

President Edward F. Clark was formerly president of the Liberty Steel Co., whose plant near Leavittsburg, Trumbull county, was absorbed in 1919 by the Trumbull Steel Co. H. M. Steele is vice-president and general manager of the company. He began his career in 1895 with the Morton Tinplate Co., of Cambridge, Ohio; in 1900 he went with the American Sheet & Tin Plate Co., first at the Muncie, Ind., plant, then successively at the works of the company at Canal Dover, Ohio, Farrell, Pa., and Cambridge, Ohio, first as special representative of the operating department and later as general manager. In 1917 he became vice-president and general manager of the Liberty Steel Co., resigning when it was sold, to help develop the Newton Steel Co.

The directors of the Newton company are Edward F. Clark, H. M. Steele, J. H. Fitch, Jr., W. H. B. Ward, H. A. Taylor, J. W. Ford and George T. Fillius. R. A. Kenworthy is secretary and J. H. Fitch, Jr., is treasurer.

The American Steel Foundries plant at East St. Louis, Ill., which has been shut down since February, 1919, resumed operations May 1, and in a few days had its full force at work. About 700 men have been put at work and day and night shifts are to be run.

Rowland G. Rice and Robert S. Jones, formerly of the F. W. Marke Construction Co., Cleveland, have organized the Rice-Jones Co., and will engage in general building construction with offices at 10600 Euclid Avenue, that city.

Cutting Armor Plate Into Scrap

Four-thousand tons of armor plate used as targets for heavy artillery shells in the big gun tests conducted at Sandy Hook during the war, are now being cut to charging box size at Sandy Hook by the oxy-acetylene process.

The plates, 3 in. thick by about 9 ft. x 13 ft., weigh between seven and eight tons each, and are being cut into sections 13 in. x 25 in., each weighing around 300 lb. The weights vary somewhat owing to the necessity for cutting through the shell holes, each plate having been punctured six times by the projectiles. Several weeks will be necessary to complete the work which is being done by the Oxweld Acetylene Co., Newark, N. J.

Shell Pierced Armor Plate That Is Being Reduced to Charging Box Size by the Oxy-acetylene Process. The plates, 3 in. thick and approximately 9 ft. x 13 ft. are being cut into sections 13 in. x 25 in., each weighing around 300 lb.

Memorial to Edmund G. Spilsbury

"Edmund Gybbon Spilsbury—A Memoir" has been compiled by Alfred D. Flinn, of the United Engineering Society, 29 West Thirty-ninth Street, New York, from which the following facts, additional to those published in THE IRON AGE of June 3, have been extracted. His technical society affiliations were as follows: President of the American Institute of Mining and Metallurgical Engineers in 1896 and of the Engineers' Club of New York in 1916 and 1917; member of the American Society of Civil Engineers, the American Society of Mechanical Engineers, the Institution of Mining and Metallurgy of Great Britain, the Mining and Metallurgical Society of America, the American Electrochemical Society; Engineering Societies Library Board from 1913 to 1920, and its chairman from 1918 to January, 1920, Engineering Foundation Board from 1916 to his death, Division of Engineering of the National Research Council of Washington and New York; he was trustee of the United Engineering Society from 1916 until his death.

After graduation from the University of Louvain, in 1862, he took a practical course at Clausthal, Germany. His practice as a consulting mining engineer and metallurgist took him into many parts of Europe, Africa, the United States, Mexico and South America. The winter and early spring of this year he spent several weeks in Brazil on a mining project for clients in the United States and had returned to New York only a few weeks before his death on May 28.

In 1864 he became assistant engineer of the Eschweiler Zinc Co., Stolberg, one of the largest miners and smelters of lead and zinc in the world, the next year he took charge of that company's mines and works on the island of Sardinia; then he went to the Atlas mountains in Morocco. In 1867 he entered the service of McClean and Stilman of London, and had charge of the construction of the iron gates for the Surrey Commercial Docks; in 1868 he was designing engineer with C. Jasper Karkort, having charge of most of the detail work of the Keulenberg bridge in Holland, the Danube bridge in Vienna and the Rhine bridge at Dusseldorf; two years later he was again with the Eschweiler Corphalic Co. as chief engineer. The same year he was sent to the United States by the Austro-Belgian Metallurgical Co. to investigate the resources in lead and zinc. After spending two years in this work he resigned to practice in this country. He was the first to introduce the Harz system of ore-dressing for the zinc ores of Pennsylvania and New Jersey.

In 1879 he designed and built the Lynchburg Blast Furnace and Iron Works; he was also consulting engineer for the Coleraine Coal & Iron Co., Philadelphia. He was managing director of the Trenton Iron Co., Trenton, N. J., from 1888 to 1897, and in this position introduced the Elliot locked wire rope and the Bleichert system of aerial tramways. In 1893 he presided over the sessions of the mining division of the International Engineering Congress of the World's Fair at Chicago.

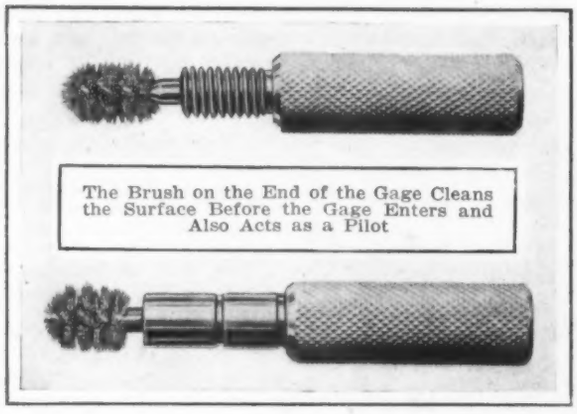
Among the technical papers which he wrote are the following: From the *Transactions of the American Institute of Mining Engineers*, "Iron Ore Deposits on the James River," 1880; "New Air Compressor," 1879; "Improvements in Mining and Metallurgical Appliances During the Last Decade," 1897. Because of his long, active service he was an authority on the evolution of the mining industry.

The Wickwire-Spencer Steel Corporation, Worcester, Mass., has leased a building at 215 West Ontario Street, Chicago, as a warehouse for its line of wire and wire products. The building is of fireproof construction and contains 35,000 sq. ft.

The corporate name of the American Gun Barrel Mfg. Co., New Haven, Conn., has been changed to the Avis Gun Barrel Co.

Combination Brush and Gage

A combination of brush and gage has been developed and patented by Herman L. Wittstein, works manager Chapman Valve Mfg. Co., Indian Orchard, Mass. By the use of this combination of the brush with the gage, it is explained, more accurate results are obtained and the life of the gage is materially lengthened. The brush tends to act as a pilot, thus to



The Brush on the End of the Gage Cleans the Surface Before the Gage Enters and Also Acts as a Pilot

eliminate almost entirely the wear commonly occurring at the entrance end of the gage.

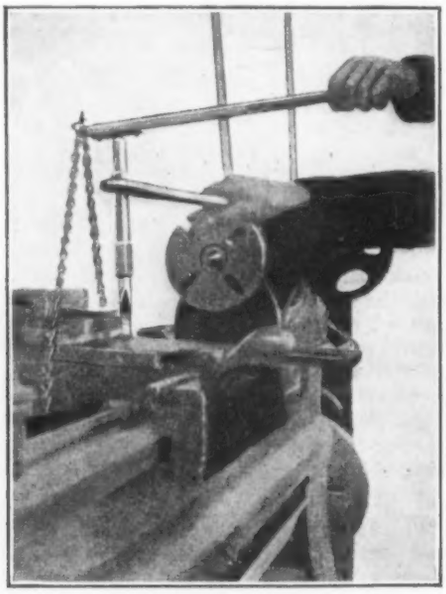
The brush cleans the surface before the gage enters, removes foreign material, thus preventing abrasive action, and at the same time gives increased accuracy to measurement and increased speed in the inspection work.

The spiral brushes are so made as to leave the bristles at slightly varying lengths so that when the brush is used in conjunction with a screw gage, the bristles tend to thoroughly clean out the thread both at top and bottom.

A company has been formed at Springfield, Mass., under the name of the Brush Pilot Gauge Co., to manufacture and market the device.

Screw Driver for Removing Rusted or Stuck Screws

A screw driver designed for removing rusted or stuck screws has been developed by the Ackland Specialty Co., Springfield, Mass. The tool comprises a ratchet, socket wrench, drill and screw driver com-



Tool Comprising Ratchet, Socket Wrench, Drill, Screwdriver, and Lever Device for Removing Rusted or Stuck Screws

bined with a specially designed lever device for holding the tool to the work.

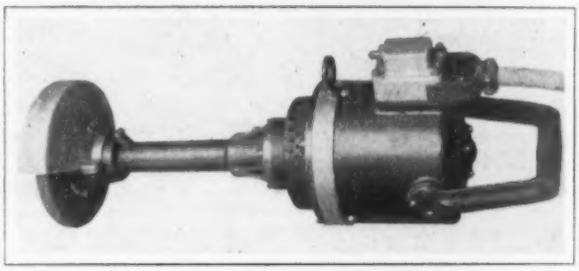
The post is attached to the blade by a socket and sliding on the post is the ratchet which permits using the tool in narrow and restricted places. A cross bar secured to the post by a ball joint permits movement in all directions. Pressure to hold the blade in the screw slot is applied at one end of the cross bar while the other end is held by a chain which is looped around some projecting lug of the machine. Three blades, ⅜, ½ and ¾-in., are furnished with the tool.

Union of Business Interests

The Illinois Chamber of Commerce, 10 South La Salle Street, Chicago, has been organized to unite the forces of Illinois on State problems pertaining to business. As both labor and agriculture are represented by strong State organizations, the need for a union of business interests has long been felt. More than 50 of Illinois' largest cities are represented in the charter organization. Its present plans chiefly concern legislation, increased production in the factory and on the farm, and the establishment of a Bureau of Business Research in the College of Commerce at the University of Illinois. Clayton Mark, president Steel & Tube Co. of America, is chairman of the Chicago committee in charge of memberships.

Grinders for Dressing Off Gas and Arc Welds

Alternating and direct current aerial grinders designed particularly for dressing off the overflow metal along the welding line have recently been developed by the Van Dorn Electric Tool Co., Cleveland. The grinders are each suspended on a spring with 12 in. extension and 6 in. x 1 in. x ½ in. guarded wheel. The direct current grinder and 3-phase alternating current grinder



Electric Grinder for Light Grinding and for Dressing Off Gas and Arc Welds. This is the alternating current machine; the direct current machine is similar in appearance

are ½ hp. and the single phase a. c. grinder is 1/3 hp. A. I. E. E. rating.

In all three types the end plate and extension spindle housing are made of steel. In the d. c. type the motor housing is also steel, but in the 1/3 hp. and ½ hp. a. c. types this is constructed of aluminum to keep down the weight. Both types are completely equipped with ball bearings. The shaft is locked to the inner races of the ball bearings to provide end thrust and eliminate shaft wear.

The Woburn Machine Co., Woburn, Mass., has increased the pay of its machine shop and wood-working department employees $2.40 per week. The increase was given on the twenty-second anniversary of the founding of the company. Thomas H. Marrinan and Daniel P. O'Brien, its founders, still take an active part in the affairs of the company.

About a score of machinists on strike at the Wickwire-Spencer Steel Corporation, Clinton, Mass., plant, for the past five weeks have returned to work. Two men who were on strike were refused employment. Demands for a 10 per cent increase in wages were refused.

Freyn, Brassert & Co. are installing new boilers of 1500-hp. capacity at the blast furnace of the E. & G. Brooke Iron Co., Birdsboro, Pa.

Features of a Modern Steel Plant

Steps in the Manufacture of Steel Products from Raw Material at the Maryland Plant of the Bethlehem Steel Corporation

THE Maryland plant of the Bethlehem Steel Corporation was described in detail by R. B. Gerhardt, electrical superintendent Bethlehem Steel Co., Sparrows Point, Md., in a paper "Electrical Features of a Modern Steel Plant," presented at a recent meeting of the Philadelphia section of the Association of Iron and Steel Electrical Engineers, 513 Empire Building, Pittsburgh. This plant is now nearing completion after undergoing an extensive construction program for the past four years, involving the expenditure of 50 millions of dollars. The paper follows through the various steps in the process of manufacture of steel products from raw materials and points out the part electricity plays in each step. The paper was in part as follows:

Ore Handling Plant

At Sparrow's Point raw materials for making steel are received; iron ore by a line of the company's steamers from Bethlehem mines in Cuba and Chili; coal by rail or on scows from the mines in Pennsylvania and West Virginia, and limestone by rail from the company's quarries in Maryland and Pennsylvania.

The steamers are docked at the ore wharf and unloaded with two 7½-ton Brown unloaders and two 15-ton Mead-Morrison unloading bridges. The former handle the ore into cars or into a trough from which it is put into stock piles in the ore yard, with a Hoover & Mason 15-ton ore bridge, while the latter can handle the ore direct from the boat into the stock pile. Up until the present time the second Mead-Morrison bridge has not been put into operation, but with the remaining equipment a cargo of 10,000 tons is unloaded in an average working time of 16 hr.

The bridges cover a trestle which connects the blast furnace stock bins and carries electric scale type transfer cars, which weigh and distribute ore and stone to the furnaces. The limestone comes to the plant by rail and is unloaded from a trestle on the wharf side of the ore storage yard. All of the ore handling equipment is electrically driven. The average power required to handle a ton of ore from steamer to stock pile and then into the furnace stock bins is 1½ to 2 kw-hr.

Coal Handling Plant

Coal is received on large open scows and unloaded with two Mead-Morrison 7½-ton bridges, and handled either into the stock pile or into a weighing hopper and into cable cars, which deliver it upon inclined belts and into the bins over the breakers. When coal is received by rail it is dumped into one of four unloading pits, located on the opposite side of the yard from the wharf, and is then handled by the bridges. Plans are being made for later installing an electric car dumper, which will deliver coal into the cable cars and from these cars it can go either to the belts or can be distributed in the yard and put into storage by the bridges.

After the coal passes through the breakers, of which there are two, driven by 75-hp. motors, it goes up a second inclined conveyor to a bin over the crushers, the waste from the breakers going to various parts of the plant where it can be made use of. There are four Pennsylvania crushers, each driven by a 400-hp. motor, and the coal after passing through these is carried up a third inclined belt conveyor and over a system of conveyors into one of three bins, which feed the six batteries of by-product coke ovens. All of the coal conveyors, feeders, etc., are built in duplicate, so as to insure continuous operation.

One of the features of the control of the coal handling equipment is the interlocking scheme, by means of which the operators, in the event of something going wrong with any piece of apparatus in a unit conveying system, can readily shut down the system, thus preventing any piling up or spilling of the coal due to such failure. This scheme is the result of considerable experience with such interlocking schemes at Sparrows Point.

All stationary motors in dusty and dirty locations are mine-type machines, totally inclosed and arranged for suitable ventilation. This also holds true of the motors on the coke handling system, where the dust and dirt has even a more disastrous effect on insulation. All open-type motors, such as the large crusher motors, are located in a dust-tight room with ample ventilation.

Coke Ovens

There are six batteries, 60 ovens each, of Koppers by-product coke ovens, each of which have a coking capacity of 750 tons of coke per 24 hr. The crushed coal from the three bins before mentioned is distributed to the individual ovens by electric larry cars, which travel over the top of the ovens on a track and which carry just sufficient coal to make one oven charge. This charge is weighed into the larry from the coal bin. To charge an oven, doors in the roof of the oven are removed, the larry car spotted over these openings and slowly dumped. When the oven is nearly full of coal the leveling ram on the pusher is run back and forth through a side door near the top of the oven, which uniformly levels off the charge. The oven doors are then sealed up and the coking process takes place. Gas and tar pass off into a large collecting main running the length of the battery and connected to each oven. From this main the gas is exhausted by turbine-driven centrifugal exhausters into the by-product plant, where the various by-products are extracted, and it is then pumped to the city of Baltimore for domestic uses. The steam used at the coke ovens for the exhausters, pumps, stills, etc., is produced in a modern boiler plant equipped for burning coke braize.

After the coking process has taken place the gas connection is closed off, the oven doors are removed on each end of the oven by electric door machines, specially designed for this purpose, a guide placed on the discharge side, and the coke car (handled by electric locomotive) is placed to receive the coke. Next the electric pusher ram is run through the oven, pushing the hot coke out into the car, from which it is dumped, after quenching, upon a wharf and allowed to cool. From the wharves the coke is fed on inclined belt conveyors and carried to screening stations where the fines are removed, and it then passes over belts to stock bins over the blast furnace trestle to be h ndled from this point into the electric scale transfer cars and into the furnace stock bins.

The heating of the ovens is accomplished by gas, and this is burned on a regenerative principle. Reversing the burning of this gas is taken care of entirely automatically by master clocks and electric reversing mechanisms for each battery. To maintain the gas pressure as nearly constant as possible in the gas and tar collecting main on each battery an electric governor is used consisting essentially of a motor-operated butterfly valve which is opened or closed as the pressure rises or falls, the motor being controlled by a pontoon switch.

There are two electric door machines and one pusher for each of the six batteries, while one 21-ton locomotive serves two batteries for handling the coke. The method of getting current to these machines is quite an electrical problem, which we think has been mastered after years of experience. The door machines and pushers are fed in battery units through a set of conductor angles, located above the oven doors along each side of the battery, and the insulating of these angles is the

big problem, as such insulation has to stand ice, moisture, dirt and heat from the coke, as well as strains from expansion of the bars. Asbestos-covered wood blocks covered by a sheet iron trough have served the purpose fairly well, but the best insulator is a trolley barn hanger using porcelain instead of molded composition as an insulator with outer canopy for protection. For feeding the electric locomotives a catenary trolley design is used with pantagraph collector on the cars.

For the total coke oven plant, including the coal unloading and crushing end and by-product plant, there is a total of 174 motors representing 8035 hp. The power consumption of these motors per ton of coke averages 1.3 kw-hr. per ton.

The lighting of the coke oven batteries is accomplished mostly with flood light projectors, which method is very effective, since these units can be placed out of range of the heat, smoke and dirt and still be very effective.

Blast Furnaces

There are four 450-ton blast furnaces in operation and two 500-ton furnaces nearing completion. All of these are built essentially alike as far as the stocking, charging, blowing and tapping features of design are concerned.

The stock bins are of reinforced concrete with cast wear plates in the bottoms, constructed with louvres and motor-driven roller feeders. The stock is handled by Hoover-Mason electric scale transfer cars into these bins, and fed from the bins over the roller feeders into cylindrical buckets with bell hopper bottoms.

The buckets with contents are weighed and handled to the skips by Hoover-Mason electric scale larry cars, each car carrying two buckets and provided with a motor for rotating while being filled to give an even distribution of the stock going into the furnace. The skips pick the buckets from the larries and carry them up to the top of the furnace and dump them. While one bucket is traveling up the skip and being dumped, the other is carried by the larry under the bins for filling. The four older furnaces are equipped with Otis steam-driven skips, while the new furnaces are equipped with Otis two-speed motor-driven skips.

For blowing the furnaces there are two gas-blowing engine stations, arranged for a total of 14 Bethlehem engines, and all necessary auxiliaries, including gas washers, pumps and compressors, and these two stations operate in conjunction with the old steam-driven blower station. Some of the steam blowers are arranged for blowing Bessemer converters. A condenser plant also forms part of the steam station. There are four stoves or hot ovens for each blast furnace as well as dust catchers, separators and a static washer for rough cleaning of the gas.

Each of the four older furnace layouts comprises a battery of gas-fired water tube boilers, 10 per furnace, making a total boiler plant of 10,000 b.hp. The most of these boilers are not operated unless there is a surplus of gas from the gas engines. There are two fresh water pumping stations arranged so that each takes care of a battery of four blast furnaces, and equipped with motor-driven compressors and pumps.

Included in the blast furnace department in addition to the blowing engine houses are a ladle house, pig-casting plant, skull cracker plant and sintering plant, and all of the equipment in these plants is electrically driven. The average power consumption per ton of pig iron, excluding casting plant and sintering plant, is 6.9 kw-hr. The casting plant runs only intermittently, as hot pig iron from the furnaces is shipped in ladles direct to the open-hearth plant, and consequently is not figured in this power. The power consumption at the sintering plant averages 15.5 kw-hr. per ton of sinter.

Open Hearth

There are two open-hearth plants. No. 1 contains five 50-ton tilting furnaces which are operated as straight, basic steel producing units, or in conjunction with the old No. 1 Bessemer plant, equipped with metal mixer, iron cupolas and four 18-ton converters, to produce duplex steel.

No. 2 open-hearth plant is built as a duplexing unit and contains one 1300-ton hot metal mixer, which receives the hot pig iron from the blast furnaces. Metal from this mixer is drawn off into a ladle and poured into one of three 25-ton Bessemer converters, where it is blown, and then removed in a ladle and charged into one of four 200-ton tilting furnaces to undergo the open-hearth process. Provisions are made for a second 1300-ton mixer and a fourth converter when it is desired to increase the capacity of this plant. A 250-ton hot metal mixer is installed between No. 2 and No. 3 open-hearth furnaces to hold hot pig iron for making up the open-hearth heats. Steel is drawn from the furnaces into 100-ton capacity ladles and poured into molds from the various pouring stages in the pit. The furnaces are arranged to burn oil, tar or producer gas. A gas producer plant is located adjacent to the furnace section of the duplexing plant and is equipped with electric-driven machinery for handling coal and ashes. A waste heat boiler, rated at 600 b.hp., is installed in connection with each furnace. Steam from these boilers is used at the gas producers and in the finishing mills.

A liberally designed bottom house forms a part of the Bessemer plant and is equipped with electric crane, grab bucket trolley and motor-driven grinding and crushing machinery, and gas-fired drying ovens.

[A table included in the paper gives the electrical equipment per unit in the open-hearth plant.] The average power consumption in No. 2 open-hearth with one furnace duplexing, two furnaces on cold charge, is 4.6 kw-hr. per ton of ingots.

Bloom and Rail Mills

These are the old original mills of Sparrow's Point. The bloomer is a 36-in. two-high reversing mill, driven by a 42 x 60-in. twin engine, and the rail mill is a 26-in. three-high mill, built in three stands. The one roughing stand is driven by a 36-in. and 66 x 66-in. Porter-Allen engine, and the one intermediate and one finishing stands are driven by a similar engine. Blooming and rail mill engines are operated condensing on a Weiss barometric condenser. There is a boiler plant for supply steam for these engines located adjacent to the mill, and contains 20 boilers each rated at 250 b.hp. and arranged for oil firing. Steam-driven hydraulic pumps for taking care of manipulators, shears, table lifts, transfers, etc., are located in a pump house near the boilers, and this building also contains a fresh water pumping plant and boiler feed pumps. The blooming mill screwdown and all tables, straighteners, saws, drills and finishing machines are motor-driven. A continuous reheating furnace forms a part of the rail mill equipment, and all auxiliaries used with this furnace are electrically driven.

Bloom, Billet and Bar Mills

These mills are located in one building and arranged so that billets, slabs and sheet bar can be rolled direct from ingots. The heats from the open-hearth are transported over a 3-ft. gage road to the 200-ton electric strippers by steam locomotive. After stripping they are weighed and shifted into the soaking pit building, which contains six rows, four furnaces per row, of producer gas-fired soaking pits with electric-operated covers. Here two 10-ton ram-type soaking pit cranes charge the ingots into the pits and draw them again when they have reached a rolling temperature, delivering them upon an electric ingot buggy which transports them to the blooming mill approach tables, where a hydraulic cylinder dumps the pot containing the ingot and it is delivered on the table.

There are two sections to the mill approach table, the first controlled by the ingot car operator and the second by the roller. Each section is driven by a 55-hp. motor. The front and back mill tables are each made up of 21 rollers 18 in. in diameter, spaced 27-in. centers, and each table is driven by a 150-hp. engine-type motor having a normal speed of 100 r.p.m. On the mill screw-down there are two 100-hp. motors, and the side guards, which are installed with manipulator fingers on front and back table, are driven by four 75-hp. motors, with two 75-hp. motors on each set of fingers.

The blooming mill is a 40-in. Mesta mill, driven by a

General Electric, 500-hp. d.c. reversing motor equipment, which consists essentially of two 2500-hp. motors mounted on one common shaft, each motor being supplied with energy from a 2000-kw. 600-volt d.c. generator; the two generators form a part of a flywheel motor generator set, of which the remaining parts are one 3000-hp. 6600-volt 375 r.p.m. induction motor for driving the set, and one 50-ton flywheel for taking care of the peak loads and preventing same from being reflected back on the electrical system. A separate motor-driven exciter supplies current for motor and generator fields.

The speed range of the motor is from 0 to 120 r.p.m. in each direction. An air conditioning plant is used in connection with a blower for providing forced ventilation for the motor, and a liquid slip regulator is used for controlling the motor driving the flywheel set.

In the blooming mill 21 x 43-in. ingots, weighing 16,500 lb., are rolled down to 9 x 38-in. slab sections in 16 passes. The average power consumption for this operation is 10.4 kw.-hr. per ton of finished slabs. This figure represents records taken over an extended period of operation and covers idle running of the flywheel set and auxiliaries while no steel was rolled. [Load charts from the various mills are reproduced in the paper.] The steel is then carried over tables and a broadside transfer and sheared in an 800-ton steam hydraulic shear into slabs, which are loaded on narrow-gage trucks and shipped hot to the plate mills. Ingots 21 x 33 in., weighing 12,000 lb., are rolled down to 8 x 8-in. blooms in 20 passes, carried over connecting tables, cropped in a 500-ton upcut shear and cut to proper lengths for rolling into billets or bars. The average power consumption over an extended period is 20.8 kw-hr. per ton of finished blooms.

Beyond the broadside transfer there is a roller table which delivers the blooms to a six-stand 24-in. Morgan continuous mill, where they are rolled down to 4 x 4-in. billets or 8 x 2-in. slabs. The billets are taken from the 24-in. mill delivery table, over a broadside transfer, to a roller run and delivered to a 500-ton steam hydraulic shear, and sheared into shipping sizes. If short billets are required they drop into a conveyor under this shear and are delivered into bins and cooled in the yard for shipment. Long billets pass over cooling beds beyond the shear and are loaded by crane for shipment.

The 8 x 2-in. slabs from the 24-in. mill pass over a connecting table and through a six-stand 18-in. Morgan continuous mill, where they are rolled into sheet bar. Beyond this mill there is a flying shear for cutting the bar into proper lengths and a bar piler for piling them ready to be handled to the cooling beds.

The 24-in. mill is driven by a General Electric 4000-hp. 6600-volt three-phase 25-cycle 83.3 r.p.m. wound rotor induction motor connected directly to main mill driving shaft. The power consumption of the 24-in. mill averages 9.55 kw-hr. per ton of finished billets.

The 18-in. mill is driven by a General Electric 3250-hp. motor, 94 r.p.m.; 26.8 kw-hr. per ton of finished sheet bar is the average power consumption of this mill.

All of the main roll-driving motors are housed in a motor room separated from the mill proper and running almost the entire length of the mill building. In this room is also located all the magnetic control equipment for the mill, an air compressor and fresh pumping plant, as well as a substation which comprises two 1000-kw. motor generator sets and a 1200-kva. transformer bank for furnishing 250-volt, d.c., and 550-volt, three-phase, a.c. power for the mill and auxiliaries.

In the blooming, billet and bar mill layout, including a roll shop, there are two 200-ton stripper cranes, two 10-ton soaking pit cranes and 13 miscellaneous cranes.

Sheared Plate Mill

Slabs or ingots, weighing 3000 to 9000 lb. are loaded on narrow gage trucks by one of three electric cranes in the slab yard, to make up the heats. These trucks are handled by narrow gage shifter into heating furnace section of the mill where slabs are charged by special electric slab handling or charging cranes into stationary gas-heated furnaces, of which there are six, each having four electrically-operated doors and electrical gas-reversing equipment. Hot slabs or ingots are taken from these furnaces by the charging cranes and dropped on an ingot car, operated by cable from an electric winch, which delivers them on the mill approach table from which they are in turn delivered to the mill proper for rolling. The distinguishing feature about the drives on the mill auxiliaries is that front live table, back live table, lifting table and middle roll balance are all motor-driven by 150-hp., 230-volt, d.c., slow speed, engine type motors, the normal full load speed of each being 100 r.p.m. The mill itself is a Mesta three-high 36 x 110-in. mill, and is driven by a General Electric 4000-hp. slip ring motor; 6600 volts 3-phase 25-cycle, 83.3 r.p.m., connected direct to the leading spindle. The screwdown is operated by two 75-hp. mill type motors connected permanently in series. Manipulation of the slabs is done by hand.

After the piece is rolled down to a plate it passes over a connecting table to the straightening machine, which is driven by a 200-hp. motor, shunt wound. From the straightener it passes over a connecting table to the inspection table, where it can be edged up or turned completely upside down as desired, by means of five 55-hp. motors. Next the plate passes to the laying-out tables and from thence to the cross-cut hydraulic shear. From this point it is handled on castors by hand to the longitudinal hydraulic shears, then weighed and pushed by hand upon distributing conveyors from which it is discharged by means of kick-offs upon piles, to be loaded by one of three shipping cranes into cars.

The hydraulic power for the cross-cut shears and two longitudinal shears, as well as for the shears in the other mills, is obtained from three high pressure pumps, each driven by a 350-hp. motor.

Coal gas is used in the heating furnaces, and this gas is made in producers, each driven by a 5-hp. motor. Features worthy of note in the gas house are an automatic coal skip for handling coal from pocket under railway track up to bins, also a scale larry car for distributing coal to the producers, and an electric telpher car for handling ashes from the producers. A similar telpher is also used in the heating furnace building for handling cinder from the furnaces into railway cars.

Miscellaneous equipment covers 50-ton crane over the mill, with 15-ton auxiliary hoist, 5-ton scale crane, electric-driven chariot for changing the middle roll, slow speed device with mill type motor for turning up rolls while in the mill, a roll turning lathe, two motor-driven scrap shears, a circular shear, and a knife grinder, and a 75-hp. motor-driven air compressor.

The power consumption on the main motor averages 21.0 kw-hr. per ton of slabs, and on the total mill 44 kw-hr. per ton slabs rolled. Average slabs rolled are 6 x 38 in., 4000 lb. Finished plates average ⅛ x 72 in.

60-In. Universal Plate Mill

This mill is still under construction, but it is fast nearing completion and will probably go into operation very shortly. The heating furnace arrangement is exactly similar to that of the 110-in. plate mill; but on account of the longer plates rolled, the ingot buggy in this mill delivers the slabs along the side of the mill approach table and they are pushed on to table with an electric pusher. The front and back live tables each consist of 22 rollers, 16 in. in diameter mounted 27 in. from center to center. Each table is driven by a Crocker-Wheeler engine type motor rated at 150 hp., at 100 r.p.m. The mill proper was built by the Morgan Engineering Co., and is a 60-in. two-high reversing mill, designed to roll a 62 x 13-in., 10,000-lb. slab down to ⅝ x 60-in. plate in 21 passes. The body of the horizontal rolls in contact with the slab is 36 in. in diameter, and that of vertical rolls is 21 in. in diameter. Maximum speed of horizontal rolls is 100 r.p.m., and of vertical rolls is 180 r.p.m. The screwdown is driven by two 80-hp. mill type motors, and each pair of vertical rolls is adjusted with a 50-hp. mill type motor. A Westinghouse reversing equipment is used for driving this mill, and consists of motor, flywheel, motor generator set, exciter, liquid slip regulator, switchboard and air conditioner. The motor unit consists of two armatures mounted on one shaft, which is

supported from a heavy bed plate in two pedestal bearings. This bed plate also supports the two field frames. The maximum peak rating of this motor is 17,500 hp., and the speed range is from 0 to 100 r.p.m. in each direction.

The flywheel set consists of two 3000-kw. 700-volt d.c. generators for supplying current to the main mill motors; one 5000-hp. 6600-volt 3-phase 25-cycle, 368 r.p.m., wound rotor motor for driving the set, and one 75-ton flywheel, all mounted on a common bed plate.

The exciter is a 3-unit machine, and supplies field current for mill motors and the d.c. generators. The liquid slip regulator is used for controlling the motor on flywheel set, and the switchboard handles current to each unit. The air conditioner washes the air used for ventilating the main motors.

The essential difference between this equipment and that on the 40-in. blooming mill drive is that this motor has the characteristics of a compound-wound machine, and the other has the characteristics of a shunt-wound machine.

The plate, after rolling is complete, passes through straightening rolls and over tables and transfers to the straighteners, from which point it passes on to the shears, is cut to proper sizes and delivered over additional tables to the shipping section of the mill.

Sheet and Tin Plate Mills

The sheet mills and tin plate mills are really two separate sets of mills, each in its own building, and each complete within itself, but by reason of location, similarity of product, common source of raw material and other local reasons they are treated under one head.

So-called "sheet bar" is delivered to the bar building on standard gage railroad cars from the 18-in. bar mill previously mentioned, is here classified, stored, sheared as needed by two alligator shears, each driven by a 20-hp. motor, and thence delivered to the furnaces by a 10-ton crane. This stock is hand-loaded upon furnace chargers, each driven by a 5-hp. motor, and is withdrawn and rolled in the hot mills. The heating furnaces are coal-fired, by reciprocating stokers, all stokers for one roll stand being driven through a line shaft by a 15-hp. motor.

The hot mills are arranged in four groups of six roll stands each. The two original groups have 28-in. rolls, and each group is driven by a Westinghouse 1200-hp. motor equipped with a double flywheel and liquid slip regulator, to reduce the peaks.

The latter two groups are driven by 1000-hp., General Electric motors. Experience with the 1200-hp. motors indicated that 1000-hp. units would be sufficient for the new mills, but as a matter of reserve, air ducts, connected to the mill-cooling system, were run into the foundations, and removable inclosing covers provided for the motors, so that forced ventilation can be applied to obtain higher ratings, should any changes require additional capacity. The new units have "notchback" relay control with standard grid resistors, in place of the liquid slip regulators. This type of control was chosen because of continual trouble with the liquid units, although they are now working fairly well with wood pots and large tank type coolers developed at Sparrow's Point.

The hot rolled product passes next through the squaring shears, each driven by a 5-hp. motor, is weighed and sent to the "black" pickler, a steam-operated Mesta machine. Coming from the pickler it is packed in annealing boxes and handled to the furnace doors by a 25-ton crane. The boxes are pushed into, and later withdrawn from, the black annealing furnaces by a charger, the rack of which is operated by 11-hp. motor.

Having been annealed the sheets are fed into the cold rolls, which comprise 21 roll stands, arranged in seven rows of three each, the three cross rows each driven by a large pulley through rope drives from a common pulley in the motor room. The common pulley is driven by a Westinghouse 1200-hp. motor, with notchback relay control, through a 39-tooth to 149-tooth Falk herringbone reduction gear.

The cold-rolled sheets are again annealed, "white" pickled, passed to the tinning machines, the entire process being the same electrically as just described for the black sheets. The tinning machines are arranged in four groups of 10 each, for belt drive from a line shaft, each line shaft being driven by a 100-hp. motor. Several storage battery tractors are in use for moving the truck loads of plate in the various departments.

The sheet mills comprise two sheet mills proper, one jobbing mill, one cold mill and auxiliaries. Each sheet mill consists of six roll stands, and is driven by 1000-hp. motors, duplicates of the new tin mill drives. The jobbing mill, of six stands of 30-in. rolls, is driven by a 1150-hp. motor, and is in every way similar to the sheet mill drives. This is also true of the cold mill, except that this mill, of four stands of 26-in. rolls, has only a 500-hp. motor.

The control boards for all four motors, together with their resistors, are located on galleries in the mill substation where they are free from all the mill dirt.

The handling of the bars, up to pickling process, is identical with the tin plate practice, and practically the same machinery is involved. After this point the system differs, some plates going through the annealing and pickling process, and are galvanized and some are shipped black. The electrical equipment for all, except the main rolls, is practically all confined to small units, and light cranes, except a few mill type motors on chain conveyors and straightening rolls for handling the heavier products of the jobbing mill.

A thoroughly modern sub-station, taking power at 6600 volts, and delivering power at 6600 volts, for the main rolls, 550 volts a.c. for the constant duty drives, and 250 volts, a.c., for the cranes and cars, has been built with the mill.

Service Departments

For supplying salt water service all over the plant a central pumping station was built several hundred feet from the shore line out in the bay. The building is located on reinforced concrete piles, and is of sufficient size to house six 30,000,000-gal. pumps. Three of these units are now installed and each is driven by a 1200-hp. motor. Automatic control is provided on these motors so that they can be started or stopped by float switches on the water surge tower.

An iron and brass foundry forms another branch of the service department, and here castings for all of the plant repair work, as well as for some of the Bethlehem Shipyards, are taken care of. There are also, in this department, pattern and carpenter shops, a large machine shop, locomotive repair shop and car repair shop.

Electric Power System

Electric energy for the plant will be supplied from two sources. Approximately 17,000 kw. will be supplied from the Consolidated Electric L. & P. Co. of Baltimore, over a double 26,000-volt 3-phase 25-cycle line to No. 1 sub-station, where there are located three 7500 k.v.a. transformers for stepping down to 6600-volt for distribution through the plant. The new gas engine-driven electric power station provides all other power for the plant, and for this purpose, at the present time, five 5000 k.v.a. generators are being installed, each driven by a Bethlehem 47 x 60-in. twin tandem gas engine. This station is designed so that additions can readily be made to provide for an ultimate capacity of 100,000 k.v.a.

Furnace gas is washed in static washers at each of the blast furnaces and passes on to the power house through a gas main where a further cleaning takes place in Theisen washers, which are driven by 150-hp. motors. From this point it is carried into the distributing main and to the gasometers at each engine. Exhaust gases from the engines are discharged into a tunnel running the length of the building and carried out through a stack at one end.

For handling engine jacket water, and cooling this water in spray ponds there is provided in the same end of the power house building with the Theisen washers a system of centrifugal motor-driven pumps, also motor-driven air compressors located here, provide air for starting the engines.

Important Labor Questions Are Discussed

National Association of Corporation Schools Considers Americanization, Profit Sharing, Training of Apprentices, Shop Foremen and Office Workers

DISCUSSING such topics as Americanization of foreign-born labor, profit sharing and thrift plans, labor turnover and the training of apprentices, shop foremen and office workers, the National Association of Corporation Schools, comprising many of the largest employers of labor in the United States, held a five-day convention last week at the Waldorf-Astoria Hotel, New York.

The work of the convention is handled largely through committee reports on various phases of educational activities. These reports have been prepared in booklet form, and copies are available for distribution to those interested in specific subjects.

One of the most interesting reports was that of the committee on unskilled labor and Americanization. This report stated that much progress had been made in Americanization efforts in the past year. National, State and city governments are coming rapidly into position to do their part in the education of the foreign-born. In Akron, Ohio, for example, almost the entire work is in the hands of the public schools, fostered and in part financed by the industries of that city. Among the large metalworking industries which are conducting Americanization schools of their own are the American Bridge Co., at Ambridge, Pa.; American Rolling Mill Co., Middletown, Ohio; Bridgeport Brass Co., Bridgeport, Conn.; Pressed Steel Car Co., Pittsburgh; Warner & Swasey Co., Cleveland; Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and Worthington Pump & Machinery Corporation, New York. In all cases the company undertakes the management of the school, though in some instances teachers are furnished by the public schools. English and citizenship are the subjects principally taught. Reports were submitted by various companies showing how the work is conducted. In general the plans are similar, and the report of Robert J. Young of the Illinois Steel Co. will serve to illustrate the methods usually employed. In getting its campaign of Americanization started, the Illinois Steel Co. first secured the co-operation of the Y. M. C. A.; then held a meeting of all the foremen to present the subject. At this meeting the plant general superintendent presided, speeches were made by superintendents, a Y. M. C. A. worker and by foremen, who had been requested, previous to the meeting, to be prepared. At this meeting, a dinner was served. As to organization, an official was appointed by the general superintendent to have general supervision of the campaign and co-operate with the Y. M. C. A. worker. A committee was then appointed in each department to co-operate with these men and with the foremen in their department in working for candidates for naturalization. As the work progressed, groups of candidates were taken to the office of the clerk of the Superior Court, where they filed their declarations of intention to become citizens, and were given first papers. The naturalization forms were filled out before the men were taken to the court.

As soon as a candidate received his first papers, he was presented a booklet, "Guide for Applicants for Citizenship," by O. O'C. Cowley. Mr. Young describes the work in further detail as follows:

How the Work Is Carried On

"An Americanization campaign obviously must go further than procuring the declaration of the men to become American citizens, as the men should learn to speak our language, become familiar with our civil government, and gain some knowledge of the three R's. In carrying on this school work, we co-operate with the Y. M. C. A. and the public schools. First we have a plant committee on education, consisting of the department superintendents, who meet once a week. Each department also has its educational committee, the members of which are the superintendent, or his assistant, and the foremen in the department. The department committee directs the efforts of one or more men in the department who go among the men to talk with them regarding the desirability of learning to speak English, and explaining the facilities offered, and when a man is found who is willing to attend the classes he is given a card upon which is an introduction to the instructor of the English class at the location nearest his home. These different locations are enumerated on the card, and a check is made opposite the name of the school the man wishes to attend. The card also bears the student's name. Some of these classes are held at the public night schools, others in halls or club rooms at the public parks. The Y. M. C. A. provides the instructors for classes not held in the public schools.

"There is a slight variance in the manner in handling the school work at our Gary, Ind., plant, in that the classes are held in a plant building, that the instructors are plant employees, and that the written and blackboard work is prepared by the plant instructors. A careful check is kept on each pupil's attendance in the classes, and if a student is irregular in his attendance or stops attending school, he is interviewed and urged to carry on the work.

"To carry on a campaign of Americanization we believe it necessary to:

"Appoint an official to have charge of the work of urging employees to attend night schools.

"Appoint a committee or committees to assist and co-operate with this official.

"Post notices printed in foreign languages and describing the English school facilities and the advantages of attending the school.

"Prepare a list of all non-English-speaking employees for the use of the committees and teachers.

"Hold plant meetings—talk with employees on advantages of evening school.

"With reference to the success we have had so far, I believe a good start has been made and better results will be shown in the coming season. When the men are talked with regarding the studying of English, there seems to be a real desire on their part to take the course, but frequently this desire is not strong enough to make them regular attendants at the classes. If labor conditions would permit or when the conditions will permit the payment of a little higher wage to regular attendants, or the promotion to jobs which pay a higher wage, that doubtless would be a means to increase the size of classes and the regularity of attendance."

The committee making the report on unskilled labor and Americanization consisted of J. E. Banks, American Bridge Co., chairman; C. S. Coler, Westinghouse Electric & Mfg. Co.; C. S. Davison, International Harvester Co.; George B. Fout, Youngstown Sheet & Tube Co.; Miss Mary B. Gilson, the Joseph & Feiss Co.; Miss Margaret Reisch, American Rolling Mill Co.; S. H. Renton, American Hard Rubber Co.; B. N. Rohrer, B. F. Goodrich Co.; Oscar C. Short, Thomas Maddock's Sons Co.; G. Guy Via, Newport News Shipbuilding & Dry Dock Co.; Alfred H. Wyman, Carnegie Steel Co.

Training of Foremen

Another report of more than ordinary interest was that of the committee on training of foremen. In this report the methods of training foremen in vogue at the plants of the International Harvester Co. were gone into with considerable detail. The personnel of the classes is made up of foremen, assistant foremen and gang bosses. Among the subjects on which lectures are given are the following: Economics of business,

shop practice, industrial relations, history of the International Harvester Co., products of the company, organization of the company, economics of the harvester business, the world to-day, divided into such sub-topics as industry before and after the war, new attitudes noticed to-day in labor generally, special movements such as syndicalism, Bolshevism and the I. W. W.; department records, setting piece work rates, reduction of costs through elimination of spoiled work, maximum production, how to meet manufacturing programs, the planning department, manufacturing costs, scientific management in the factory, electricity in the shop, metallurgy, shop machine and material control, the right man on the right job, accident prevention and health, history of labor unions and their aims to-day, wage systems, the development of sound industrial relations, working conditions and their effect on production, loyalty, discipline and discharge, leadership and the application of the council plan, the industrial relations department and production, the history of a ball of twine.

The aims of the course, as stated by the company, are "to make clear the foremen's position in the management and the great responsibility of his job to-day and thus improve the company's administration through the correct interpretation of its policies; endeavor to solve some of the perplexing problems which arise in the shop by frank discussion of the same in the gathering of the foremen, and to increase the quality and quantity of production per man in the shop, which will result when we have better co-operation between the foreman and his workers."

Plans of various other companies in training shop foremen are also discussed in the report.

Training Office Workers

Reports on training of office workers and trade apprentices also were presented. The methods of training apprentices at the plant of the American Rolling Mill Co., Middletown, Ohio, are given some attention in the latter report. This company is typical of the sheet metal producing industry. It has five trades represented in its apprenticeship courses, including the machinist, molder, pattern-maker, electrician and blacksmith. Class room work is given in each trade represented. This work includes mechanical drawing, shop sketching, elementary design, mathematics—pure and applied, practical and theoretical—electricity in D. A. and A. C. work, trade and shop lectures, and general educational work on health, hygiene and safety subjects.

All applicants for apprentice work are supposed to have the equivalent of eight years' common school work before being admitted to the courses. The age limits are wide and vary from eighteen years to thirty-five years or older in specific cases. Married men who are desirous of entering the trades are accepted on the same basis as the unmarried men.

A trial period is required of all applicants who are selected to begin work in any trade; this period averages three months' time and in event the candidate manifestly shows his unfitness for mechanical work, he is eliminated at the end of this trial period.

Apprentices Work in Turns

All apprentices work the regular turns same as the journeymen, regardless of length of turns or time of shifts.

In the machinist's trade, the apprentice is given his preliminary training in a training shop which operates under the same conditions and regulations as the regular maintenance shops, with this difference: while the apprentice is undergoing his preliminary training in the training shop, he is under direct charge of an expert instructor whose chief aim is to teach him the correct way of doing the job and also the way which involves the least expenditure of time for its completion.

After the trial period and first period of training, the apprentice is shifted alternately between the training and maintenance shops until such time as he has completed his course.

The molder apprentices receive their preliminary training on the side floor or core room under men who are thoroughly conversant with the art of molding and who teach the apprentice what they know. The apprentice later on goes to the main floor (large work) to complete his course.

The electrician, blacksmith and pattern-maker apprentices receive the practical experience which goes with their trades under competent foremen in the various departments employing apprentices who are in training in the trades. Part of the electrical apprentices are shifted into the machinist training shop for one period of from three to six months in order that they may become familiar with some of the mechanical details and practice involved in electrical machinery construction.

Since all work in this plant is of the miscellaneous maintenance order, no regular sequence of work for instructional purposes can be obtained.

Practical as well as theoretically trained instructors are utilized for the classroom work. In all cases where it is practical to do so, the same men act as classroom instructors whose regular job is that of a shop foreman or superintendent.

The material used for classroom instruction varies from that obtained in specially prepared lesson sheets and regular trade text books to that of hand books and trade publications. Two hours per week is given to classroom instruction for a period of two to three years. Classroom work is paid for on a schedule of rates somewhat different than those paid in the shop and, as it is not possible to run the school practically on a daytime basis, the class work is done in the evening. All classroom work is compared on a fifty-fifty basis with the work done in the trade in the shop.

Attendance records of shop and classroom are kept and checked, but no graded system of classroom merit is recorded.

Classroom laboratory equipment, particularly that involved in electrical work and experiments, is used to good advantage to help the apprentice visualize the fundamental truths and principles underlying his work.

The foremen in the respective divisions employing apprentices are advised from time to time of the apprentices' progress (classroom), and their co-operation is solicited in helping line up the boys as they advance in their work.

The foreman is made one of the party who select, grade and pass the apprentice from the day he enters the course until the day he graduates from it.

Skilled Mechanics Developed

All around skilled mechanics are developed for general maintenance and production work. The graduate apprentices fill in the regular vacancies which occur from time to time in the shop.

The regular rates paid to journeymen are then received by the graduate apprentice.

The apprentice on his graduation from the course is issued a diploma signed by a high officer of the company. This diploma states the trade which the apprentice has completed and for which he is qualified; it also states the order of classroom work completed.

After his graduation the journeyman is not required or expected to study further along his line of work except as he sees best for his own interests.

The general training program, however, provides an ample field for further instruction in technical lines which deal with the steel industry, and these courses are available to all on the payment of a small entrance fee.

Graduates of exceptional ability may obtain technical training aside from the program previously mentioned by means of scholarships in a neighboring technical school, which are furnished by an officer of the company. The acceptance of these scholarships obligates the employee in no way to continue in the service of the company after he has completed the course.

Other valuable reports were those of the committees on labor turnover; profit sharing and allied thrift plans; health education; application of psychological tests and rating scales in industry; skilled and unskilled labor.

The association, at its final session, elected the following officers: President, L. L. Park, American Loco-

motive Co., New York; first vice-president, M. S. Sloan, Brooklyn Edison Co., Brooklyn; second vice-president, Harry S. Dennison, Dennison Mfg. Co., Framingham, Mass.; members of executive committee, J. H. Yoder, Pennsylvania Railroad Co.; E. E. Sheldon, R. R. Donnelly & Sons Co., Chicago; F. E. Weakly, Montgomery, Ward & Co., Chicago; managing director and treasurer, F. C. Henderschott, Edison Co. of New York; Dr. Lee Galloway, New York University, secretary.

A proposition to establish a university course for the instruction of teachers in personnel work was discussed at the convention, and it was decided to submit the matter to the members for a mail vote at some future date.

Crating Motor Cars on Traveling Conveyors

The use of conveyor lines in the automobile industry has recently been extended to the crating department in boxing cars for export at the new Essex assembly plant of the Hudson Motor Car Co., Detroit. This department which occupies a room adjoining the assembly plant is equipped with a conveyor 100 ft. long, consisting of two moving platforms 30 in. wide, 3 in. above the floor and spaced on 10 ft. centers.

For export a crate of very substantial construction

Crating Cars for Export on a Conveyor in the Plant of the Hudson Motor Car Co. This photograph shows the car run upon the bottom of the crate located on the conveyor. The wheels are being removed after which the crate is built around the car as it moves along the conveyor line

is required, this being particularly true of the bottom. The bottom of the crate is built in the bay at the side of the conveyor and then placed upon the conveyor at the end with two hoists. Then the motor car completely assembled is run under its own power upon the crate bottom after which the wheels and other parts that have to be taken off for crating are removed and packed. The crate is then built around the car while it is moving along with the conveyor.

The conveyor travels at the speed of 9 in. per min. and eight cars are in the process of crating on the conveyor at one time. With the use of the conveyor 32 cars are crated in an 8-hr. day. The crated car passes from the conveyor on rollers out through a door to a loading dock which is served with an overhead electric traveling crane. This picks up the crate and deposits it in an open car. The use of the conveyor has resulted in a large saving both in labor and in floor space required for the crating department.

A petit jury in the United States District Court at Cincinnati returned a verdict against the Matthew Addy Co. as to 13 of 23 counts of an indictment charging violations of the Lever act, and against B. N. Ford, vice-president of the company, as to seven of 12 counts of a similar indictment. The charge against the defendants was that coal purchased by the company for $3.25 per ton, f.o.b. mines, was sold to various concerns throughout the country at $3.50 a ton, a profit of 25c. a ton, in violation of the law and the President's profit limitation of 15c. a ton. In defense of the charge of 25c. a ton above the cost price of the coal, the defendants contended that this profit was charged because of the provisions of the Lake-Peabody agreement and because it was considered that the prices fixed by the President did not extend to contracts of purchase made prior to the passage of the Lever act. It was contended also that it actually cost the company 18c. a ton to make the sales. Counsel for the defendants gave notice that they will file a motion for a new trial and the defendants were released on their original bonds pending disposition of the motions.

The last of six steel barges constructed by the Minneapolis Steel & Machinery Co., Minneapolis, was recently launched at the docks of the Twin City Forge & Foundry Co., Stillwater, Minn. The barge is 300 ft. long, weighs 500 tons, has a width of 48 ft. and a carrying capacity of 2500 tons. All of the barges were built for the United States Government for use on the upper Mississippi River.

Gray & Davis, Inc., Cambridge, Mass., report net sales for the three months ending March 31 last of $1,228,133, operating expenses of $1,328,216, and a net operating loss of $100,083. The dividend for the current quarter is omitted.

Crated Cars Pass from the Conveyor Through a Door in the Building at the Left and Are Placed in Gondola Cars by Means of an Overhead Traveling Crane. The loading dock at the right is for loading cars for domestic shipment

Semi-Automatic Two-Spindle Pointer

A new type of pointer has been brought out by the Kent Machine Co., Kent, Ohio, which will be known on the market as the Kent semi-automatic two-spindle pointer. The machine will accommodate bolts and rods up to and including ¾ in. in diameter and of any length from 1½ in. up.

All running parts are inclosed so as to insure safety to the operator. Ready accessibility for adjustment, repair or inspection is emphasized as a feature. When necessary to adjust either the cutting tool or the chuck jaws, only the front cover need be removed. The machine requires only one operator for bolts or

Bolts and Rods to ¾ In. in Diameter and of Any Length from 1½ In. Up Can Be Pointed on the New Type Kent Two-Spindle Machine

rods of ordinary length, but it is so designed that rods of any length may be pointed. All operations except the placing of the bolt in the receiving chuck are automatic.

The two spindles are actuated by a large cam and have alternate motion, which makes it possible for one operator to feed both spindles. The forward motion of the spindle is spring actuated, so that no particular care need be exercised in placing the bolts or rods in the receiving chucks except that they must extend at least 1 in. beyond the face of the jaws to permit the pointing operation. The jaws of the gripping chuck are protected, room being left only for the insertion of the bolt. Since all subsequent operations are entirely automatic, one operator can feed both spindles with the cam shaft running at 25 r.p.m., thus to make the total production of the machine 50 bolts or rods per min.

The pointing chucks are made from a solid piece of steel to provide strength and rigidity. The cutters are securely held in milled slots by self-adjusting clamps, and by loosening a screw they may be adjusted or removed and replaced when necessary. The head of the chucks are provided with tool steel guide bushings for centralizing the work to be pointed. These guide bushings are removable for the different sizes of bolts or rods.

The gripping chuck consists of two slides made of tool steel with formed jaws at their end for gripping the work. One of these slides is stationary in the machine; the other is movable and is opened by a cam mechanism. Like the forward action of the spindle, the gripping device is actuated by a spring which prevents injury to the machine should a larger bolt or rod than those being pointed be placed in the gripping chuck by the operator. The stationary jaws may be adjusted for the different sizes by a small set screw; the jaw actuated by the cam and spring automatically adjusts itself. The jaws grip the work at four points, which approximately centers it ready to enter the centralizing bushing in the pointing chuck.

It is explained that there is plenty of chip space, and as bolts and chips are carried away in different directions, a pointed product, clean and ready for the next operation, is assured. The floor space required for the machine is 31 x 41 in., and the distance from the floor to the center of the spindle is 37½ in. The total weight of the machine is 1100 lb.

Club Discusses Foundry Costs

The experience of the Buda Co., Harvey, Ill., in molding cylinders with dry sand was discussed by Jesse D. Wiseman of tnat company at a meeting of the Chicago Foundrymen's Club at the City Club, Chicago, on May 8. Through the use of the method he described the output of cylinders was quadrupled. In the discussion which followed his talk, W. H. Goldstine, foundry manager, Nash Motors Co., Kenosha, Wis., stated that the character of the cylinder to be cast, the layout of the foundry, the training of the molders, and other factors determined whether the green sand or dry sand method was the better for the job at hand. He cited the varying practice of automobile manufacturers. He was inclined to favor dry sand castings on the grounds that they proved more accurate to standard dimensions, but doubted whether costs could be kept down sufficiently to make their use profitable. In the case of one class of work, he admitted that it might be done, but in another application it would fail. Some companies, he stated, paid great attention to accuracy because of its relation to costs. The American Radiator Co. [illegible] patterns as soon as it is found that castings exceed the standard weight. This is done to save the iron, which represents a considerable investment when production over an extended period is considered.

The Ferris wheel utilized by that company to transport the mold from molder to ladle hand was mentioned as another example of the radiator company's attention to costs.

F. C. Everitt, of Miller, Franklin, Bassett & Co., New York, addressed the club on his experiences in connection with foundry costs. He emphasized the importance of a good cost accounting system as the only method of getting intelligent information on costs. Cost accounting, however, is an engineering and not an accounting problem. No system superimposed by the office on a foundry will work. The scheme must be built up in the various departments with proper attention to their peculiarities, as different conditions require different treatment if worth-while information as to costs is desired. He cited concrete examples of the successful application of time studies and new methods of handling labor in a given plant. Cutting piece work rates, he stated, killed the ambition in workmen and meant sure defeat for any plan for increased output. Sometimes granting a bonus for greater group production works better than offering a premium to the individual worker.

The Rich Tool Co., Chicago, announces that the Garlock-Walker Machinery Co., Ltd., with offices in Toronto, Montreal and Winnipeg, has been appointed its exclusive agent for Canada, to take effect immediately.

The Reed & Prince Mfg. Co., Worcester, Mass., bolts, etc., contemplates the erection of a four-story, 200 x 200 ft. reinforced concrete administration building.

Chromium and Other Alloy Steels

Iron and Steel Institute Holds Adjourned Meeting at Sheffield—Structure and Properties Under Various Conditions—Discussions

(*Special Correspondence*)

LONDON, ENGLAND, May 15.

THE adjourned meeting of the Iron and Steel Institute was held yesterday in the Mappin Hall of the University of Sheffield, and was an unqualified success. An innovation was the fact that after dinner the discussions took place in an atmosphere of smoke, even the august personages on the platform sporting well-matured briars. Your correspondent cannot recall such a keen and useful discussion during the past 15 years.

The chair was taken by the president, Dr. J. E. Stead. Professor Desch accorded a cordial welcome to the institute, and to its distinguished president on behalf of the University of Sheffield, and said that he hoped the precedent now set of discussing a special group of papers in a separate city would be followed in the future.

In acknowledging the welcome, Dr. Stead said it was a great pleasure to preside at a meeting in Sheffield, where it was very encouraging to see so many young men studying metallurgy. The happy innovation was due to the fact that a much larger number of papers were now presented to the institute than could be comfortably discussed at one meeting, and a start had been made with a group of papers dealing with alloy steels. He then referred to the very remarkable development of Sheffield since the seventies, when Sheffield industries were in rather a moribund condition as regards the application of scientific methods.

Owing to the great length of the discussions and the highly technical nature of the papers it is only possible to refer briefly to some leading points.

Properties of Iron-Chromium-Carbon Steels.

Prof. C. A. Edwards, Manchester University, in collaboration with H. Sutton and G. Oishi, presented Part 1 of a paper with the above title, covering the thermal analysis of the alloys in question.

The temperatures at which the carbides go into solution when the steels are heated, and those at which the reverse change takes place on cooling have been carefully determined by the authors. These have been tabulated and also diagrammatically illustrated in a ternary diagram. The results very clearly indicate that the temperature at which the carbides separate from solution during cooling is raised by an increase in the chromium and carbon content of the steel. In considering any particular series of alloys in which the carbon content is constant on the one hand, or the chromium is constant on the other, the separation of the carbide occurs at the highest temperature when the percentage of chromium is approximately ten times that of carbon. The temperature of this thermal change increases as the chromium and carbon content is raised along a line, in the ternary diagram, which corresponds with alloys containing about 10 of chromium to 1 of carbon.

After considering Arnold and Read's analytical results for the carbides that were separated from annealed steels, the authors conclude that there is a double carbide having the formula $Fe_3C.Cr_3C_2$. With annealed steels containing less chromium than is required to combine with the carbon to form the above carbide, practically none of the chromium exists in solution with the iron. When the percentage of chromium is greater than is required to form $Fe_3C.Cr_3C_2$, some of the chromium, increasing with the total chromium content, remains in solution with the iron after the carbides have separated from solution on passing through the Ar_1 change.

The influence of initial temperature on the critical cooling velocities has been determined for a large number of the specimens. From this point of view the alloys are most conveniently divided into two distinct groups, as was indicated by Murakami. First, those containing more carbon than $\frac{Cr}{C}$ = approximately 10, which possess similar hardening characteristics to ordinary carbon steels and second, those containing more than this ratio of chromium, which have much slower critical cooling velocities. The boundary line dividing these two groups is not very clearly defined, but the irregularities in this respect are considered to be due to the influence of varying quantities of impurities, more especially manganese and silicon.

Part II of this paper deals with the effect of heat treatment on the electrical resistivity, the authors being Professor Edwards and A. L. Norbury. The electrical resistance of the steels was determined in the annealed condition; air and water-quenched from different temperatures; and after tempering the various quenched specimens at progressively increasing temperatures. The following is a summary of the results recorded:

In the annealed condition the effect of chromium is to raise the resistivity of iron by 3.75 microhms for each 1.0 per cent in excess of 4.3 times the carbon content. When carbon is present in the alloys the addition of chromium has little or no influence upon the resistivity until the amount of the latter element is increased to above 4.3 times the carbon content. From this it is concluded that within this range of composition virtually all the chromium is in combination with the carbon, and this carbide exists in the mass as isolated patches and the iron is practically pure. It is suggested that the carbide in question is $Fe_3C.Cr_3C_2$.

When the percentage of chromium is in excess of 4.3 times the carbon a certain proportion of this excess remains in solution with the iron and thereby raises the resistivity of the alloy. Some of the additional chromium enters into a new combination with the carbon. It has not been possible to make a definite deduction as to the chemical constitution of this second carbide, but it is thought to contain about 1 of carbon to about 10 of chromium. This closely corresponds with the compound Cr_3C_2, which has been isolated by Ruff and Foehr.

The quenching experiments indicate that there is some kind of critical range of temperature at about 1000 deg. C. The maximum resistivity was not attained, even with water-quenching, until the initial quenching temperature had exceeded 1000 deg. C. This was very much the same as was found by McCance for carbon steels.

Air-quenching did not produce quenching cracks in any of the steels, although this method of treatment, as judged from resistivity determinations, appeared to be as effective as water-quenching. Water-quenching from all temperatures above 900 deg. C. produced cracks in all steels, except in three cases. With these steels no cracks were formed with any conditions of quenching.

Tempering experiments indicate that there are two distinct temperature ranges at which the carbides fall out of solution. That which comes out of solution at the lower range of temperature may be ordinary iron carbide which is slightly modified by the presence of chromium. Whereas, that which is deposited at the higher temperature might be Cr_3C_2, or Cr_7C_3. The deposition of the carbide at the higher temperature is accompanied by a remarkably large evolution of heat. This is so suddenly developed and the quantity is so

great as to cause the temperature of some of the steels to be superheated more than 70 deg. C. when the temperature is raised to about 600 deg. C.

So far as can be estimated from the results obtained in the present investigation, it would appear that the effect of chromium upon the resistivity of iron is to cause an increase of about 5.1 microhms per cu. cm. for 1 per cent held in solid solution.

Discussion

Professor Edwards, introducing the above papers, said he preferred not to use the term "self-hardening" and agreed with a recent statement of the president that this term was not satisfactory.

Dr. J. H. Andrew referred to the question of the carbides, and said he took it that all the analyses were done on annealed steels. Was it right, however, to assume that a carbide existed in the same molecular condition in quenched and annealed steels? We had no realization of the valency of the carbon atom in steel, and the question arose as to whether one could have a variable valency.

J. H. S. Dickenson, head of Messrs. Vickers' research department, discussed the critical cooling velocities of the steels, and said that the chromium to carbon ratio of 10 to 1 given by the authors confirmed some earlier results of his own. He considered the critical cooling velocities to be of the utmost importance in the metallurgy of alloy steels. The whole object of adding nickel and chromium was to obtain a critical cooling velocity which would enable the steels to be cooled over a fairly wide range. Nickel and chromium together made it possible to obtain similar Brinell hardness, with coolings varying from quenched in water to quenched in oil.

Harry Brearley said that about the year 1900, when he and Mr. Ibbotson were writing their book on the analysis of steel works materials, they devoted much time to trying to ascertain if many of the alleged compounds isolated as residues could be chemically analysed with accuracy. As a result he had no faith in such compounds, except Fe_3C. Most residues put forward as compounds were obtained by purely empirical methods. In nickel-chrome and chrome steels the great effect of manganese was almost always overlooked, and many of the curves relating to these steels were put forward too dogmatically.

T. S. Russell observed that he had fairly recently fallen into the trap mentioned by Mr. Brearley, and had analyzed the residue of a steel containing 2.6 per cent carbon and 12 per cent chromium. No matter how he obtained the residue, it gave consistent analysis corresponding to a compound FeCrC. Nevertheless, he felt very doubtful of this compound, especially as there were already claims for twelve different compounds of chromium and carbon.

Dr. W. H. Hatfield thanked Dr. Edwards and his collaborators for two magnificent papers of great value to those engaged in industrial research. With reference to Mr. Brearley's attitude towards residues, although he agreed with him, he still thought that a good deal of value could be attached to data obtained in this way. Residues were in many cases in his opinion solid solutions and not compounds.

Dr. F. C. Thompson thought the claims put forward by the authors were entirely justified, and the evidence for two double carbides of iron and chromium seemed reasonably sufficient to be acceptable.

Dr. C. H. Desch said he was glad that Professor Edwards was trying to work out a complete thermal equilibrium diagram of these ternary alloys. He fully shared Mr. Brearley's distrust of residues, but he thought there were cases in which the investigation of such residues gave good results. The results of the authors' resistivity experiments were very difficult to interpret if more than one phase were present, although they were all right for a solid solution.

Professor Edwards, in reply to the discussion, said that they had not dealt experimentally with the analyses of the carbides, and they could not argue from the quenched to the annealed states. As regards the valency of carbon, we did not know enough to settle this question, but we did know that the valency varied at different points on the equilibrium diagram. He agreed with Mr. Brearley that it was dangerous to draw conclusions from analyses of residues, but pointed out that they were attacking the problem from several aspects. They were not dogmatic, and had taken no step which they were not prepared to retrace.

Structure of Some Chromium Steels

The paper on "Structure of Some Chromium Steels" is a record of valuable work carried out by J. H. G. Monypenny, chief of the research laboratory Brown, Bayley's Steel Works, Ltd., Sheffield, with the cooperation of his staff. Most of the work was done on steels containing between 5 and 16 per cent of chromium, but the lower range was also dealt with to confirm certain characteristics. The results are recorded for chromium steels containing between 1.5 and 15 per cent chromium.

It is found that the effect of increasing amounts of chromium on the properties of steel is progressive and there do not appear to be boundaries which mark out ranges of composition where the properties change suddenly. Probably the most abrupt change is in the production of austenite on quenching from high temperatures, the limiting compositions giving this constituent being fairly sharply defined. No evidence has been obtained that chromium steels can be divided up into a number of areas of composition, the properties of which differ from each other owing to the presence of different double carbides.

Part of the carbide forming the pearlite in the annealed or tempered condition does not dissolve at Ac_1, but progressively during a range of temperature above this point. While this behavior suggests the presence of two distinct carbides, no microscopic evidence has been obtained of the presence of different carbides in the annealed samples. It is very probable that it is the solution of this carbide which gives rise to the very great increase in the hardening properties of chromium steels in the range in which it dissolves. As, however, the increase in hardening property continues after the carbide has all dissolved, it is probable that dissociation takes place in the dissolved carbide in a manner similar to that suggested by Mr. Edwards.

The rate of diffusion of carbides in chromium steel is much slower than in ordinary steel, and hence a much longer time is required to produce equilibrium at any given temperature than with steels free from chromium. Chromium also lowers the carbon content of the eutectoid point considerably, and decreases the solubility of cementite in austenite. The approximate position of the eutectoid point and of the solubility curves of the carbide (under definite conditions of heating) have been mapped out by the author. The properties of austenitic chromium steels are of great interest theoretically, since they afford proof that martensite is the first stage in the decomposition of austenite.

Discussion

Dr. Andrew McWilliam, in reference to the eutectoid point, said that in the paper published in 1910 by himself and Mr. Barnes, they had determined the saturation point (now called the eutectoid point) for a 2 per cent chromium steel, and their results were in general agreement with those of the author. Professor Edwards agreed with the author and with Dr. McWilliam as regards the eutectoid points, and demonstrated on the blackboard their position on the ternary diagram, showing why in some steels it was impossible to get the whole of the carbon into solution.

Dr. Hatfield was generally in agreement with the findings of the author, except as regards the composition of the eutectoid with variable carbon and chromium contents. He thought that the steel could hold more than 3 per cent of carbon, and that the author's method was not final. He pointed out that the microsection examined under the microscope did not necessarily represent equilibrium. By dealing with small masses, and also by the use of relatively quick cooling, one did not get the same degree of equilibrium as would be the case with larger masses.

Mr. Brierley said he was not much concerned whether the eutectoid was at 0.3 or 0.4 per cent carbon, but it

was certainly well below 0.9 per cent. He thought the conditions of the work were such as to give every facility for equilibrium, and pointed out certain aspects of the paper which he thought were of commercial value.

Dr. F. C. Thompson pointed out that wherever it was possible to compare the author's work with that of Professor Edwards and his collaborators an excellent agreement was found. Dr. Kayser stated that structures of the austenitic type were absolutely ruinous in chrome steels.

Mr. Monypenny, in the course of a brief reply, referred Dr. Hatfield to the paper, in which he would see that the writer had emphasized long soaking and slow cooling, conditions which certainly gave every opportunity for equilibrium.

Effect of Initial Temperature on Physical Properties

This is a paper of very considerable theoretical importance and merit, in which an attempt is made to correlate and explain the various changes in the physical properties of steel due to varying initial temperature and rate of cooling. The authors are J. H. Andrew, J. E. Rippon, C. P. Miller and A. Wragg, and the work was carried out in the laboratories of Sir W. G. Armstrong Whitworth & Co., Ltd. It may be added that Dr. Andrew has recently been appointed professor of metallurgy at the Royal Technical College, Glasgow, in place of Prof. C. H. Desch, now professor of metallurgy at Sheffield. The experiments were conducted on selected series of carbon, nickel, chrome and nickel-chrome steels respectively, and some of the more important conclusions reached by the authors are given hereunder.

The volume change at the normal transformation points, as shown by the dilatometer, has been found to be composed of two changes working in opposition. (a) allotropic change, and (b) change due to carbide. The latter change in steels of high carbon content is not completed at the ferrite or carbide line, but continues to a temperature depending on its composition, increasing particularly with the carbon content. The quantity of the change due to carbide has been shown to be a measure of the molecular concentration of the carbide in solution and controls the temperature at which the allotropic transformation takes place. Quenching merely stereotypes the condition of the carbide, which in its turn controls the allotropic change. This variation in the molecular concentration is readily explained by the assumption that carbide dissociates at and above the temperature of the normal transformation point.

The authors find that nickel-chromium steels behave in much the same way as carbon steels, excepting that in the latter the time factor necessary to produce the same changes in the carbide is of a much lower order. Martensite has been shown to be the product formed when the allotropic change has been depressed by dissociated carbide to a temperature at which the latter is able to exist as such in the alpha-iron formed. At the temperature of the normal transformation point martensite is not formed as an intermediate phase between austensite and pearlite.

When the molecular concentration of the carbide is such that the allotropic change is depressed below atmospheric temperature, the resulting product will be austensite, i.e., the iron is retained in the gamma state. By tempering austensite in such a way that the carbide becomes partially associated, the allotropic change is able to take place on re-cooling, forming martensite, thus explaining the phenomenon of secondary hardening.

Electrolytic separation of carbides in a nickel-chrome steel, in which the transformation has not occurred at the normal temperature (600 deg. C.), shows upon analysis a total absence of chromium. This is additional evidence that the abnormalities of nickel-chrome steel are due to iron carbide, rendered more stable by nickel and chromium, in solution in the iron.

Extensive tempering experiments have been carried out—dilatation, resistivity and magnetic—which enable the proportions of alpha and gamma-iron in the quenched product of any steel to be determined. It has also been shown that in the carbon steels experimented with, quenched at 1000 deg. C., the iron in the product is in the alpha state. In alloy steels gamma-iron is present in various proportions, particularly with high carbon content. In extreme cases alpha is entirely absent.

Discussion

Dr. Hatfield said that the authors claimed that martensite was a solid solution of dissociated carbide in alpha-iron, but that there were alternative explanations. He thought it was not particularly sound to base their claim on the magnetic properties of alpha-iron. He thought there was no doubt, however, that martensite was a solid solution of carbide in gamma-iron.

Dr. F. Rogers asked if the dissociation of the carbide could be explained as being due to dissociation into elementary carbon. He had carried out a series of experiments with high-speed tool steel, which showed conclusively that the tools had not taken cutting hardness until cooled below 100 deg. C. If removed from the furnace at higher temperatures and used in a lathe the nose was immediately wiped off.

Dr. Andrew McCance was in agreement with the authors as regards the solution of the carbide in alpha-iron, and pointed out that one could not get gamma-iron to become magnetic without changing its volume.

Dr. Andrew, in the course of his reply, said he was very glad to have Dr. Rogers' confirmation of the low point of hardening at 150 deg. C.

Brittleness in Nickel-Chrome and Other Steels

Under the title, "Brittleness in Nickel-Chrome and Other Steels," Dr. F. Rogers, of Sheffield, presents Part II of a paper read before the institute last year. The previous paper gave the author's conclusions and did so in such a vague and tentative manner as to arouse comment, while the present paper gives the data on which the conclusions in question were based and restates one of the most important of them. He now says that nickel-chrome steels appear to be capable of developing higher impact values under correct treatment and lower impact values under incorrect treatment, first, if the mode of manufacture has involved relatively intense hot working, and second, essentially after hardening treatment. Most of the previous speakers took part in the discussion of this paper. With the exception of Dr. Kayser they disagreed entirely with the author's conclusions, and with his supplementary remarks. Dr. Hatfield was particularly delighted at being able to agree with Harry Brearley and Mr. Dickenson for the first time that evening. The president closed the discussion.

The following papers were taken as read: "Note on the Structural Constitution, Hardening and Tempering of High Speed Steel Containing Chromium and Tungsten," by Kôtarô Honda and Takejirô Murakami, and "The Effect of Various Elements on the Electrical Resistivity of Iron," by A. L. Norbury.

Among the recent sales made in New England by the Hoskins Mfg. Co., Detroit, maker of electric furnaces, are: Five heat treating furnaces to the Fairbanks Co. for a new England plant; three to the U. S. Bobbin & Shuttle Co., one to the W. H. McElwain Co., and one to the William Corey Co., all of Manchester, N. H.; one to the Worcester Lawnmower Co., Worcester, Mass.; two to the American Shear Mfg. Co., Nashua, N. H., and one, 5 ft. long, to the recently incorporated F. O. Wells Co., Greenfield, Mass.

In a report covering the first year of its existence the Industrial Bureau of the Board of Trade shows that about 100 new industries have been established in Baltimore during the 12 months, representing a plant investment of $34,691,700, and employing 21,536 workers. In addition there were 134 expansions, with an outlay of $37,920,500, and employing 18,314 additional workers. George C. Smith is director of the bureau.

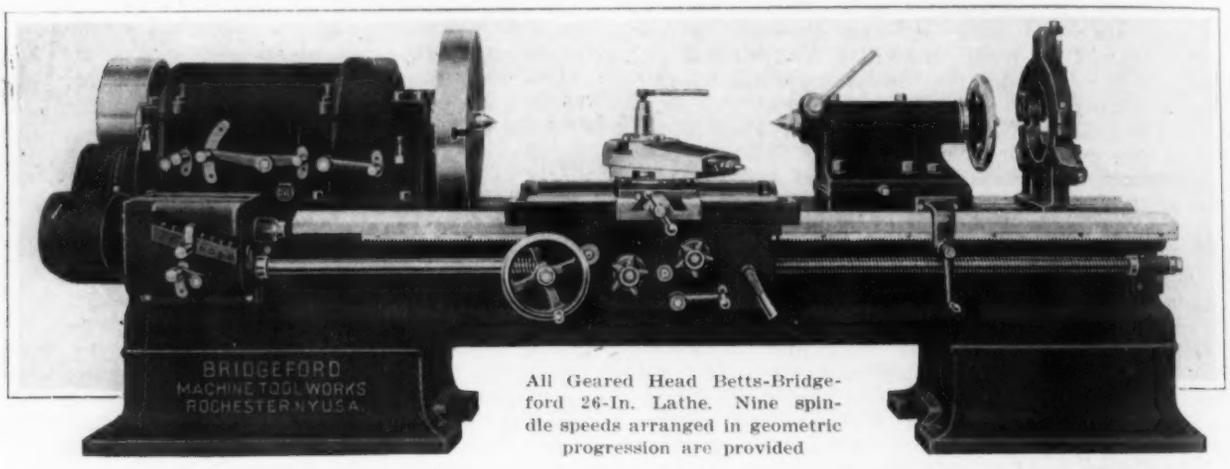
The Bardach Iron & Steel Co., Norfolk, Va., is now being incorporated to conduct a general iron and steel warehouse and scrap business.

26-In. Geared Head Lathe

A geared head lathe swinging 26 in. is a recent product of the Betts Machine Co., Rochester, N. Y. The head-stock is inclosed and is operated by an expanding ring friction clutch upon which is mounted the driving pulley. This clutch is operated from the apron, a position which is always convenient to the operator. The same movement which disengages the clutch automatically applies the friction to the brake, thereby stopping the machine almost instantly.

There are nine spindle speeds arranged in geometric progression. These are of the selective type and provide three direct speeds, three high back-gear speeds and three low back-gear speeds, all obtained by conveniently located levers in front of the head-stock. All speed changes are through hardened steel sliding gears and positive clutches running in oil, the gear teeth being rounded to allow for easy and quick engagement, but no two speeds can be engaged at the same time.

All shafts and gears are located in the lower half or base of the head-stock and not in the cone, thereby to allow ready access to all parts, it being only necessary to remove the cover. All shaft bearings are bronze bushed and lubrication to bearings is by splash and chain oiling system. When motor driven the motor is mounted on top of the head-stock cover and directly connected through gearing to the main driving shaft.



All Geared Head Betts-Bridgeford 26-In. Lathe. Nine spindle speeds arranged in geometric progression are provided

A heavier all-geared head lathe designed to swing 60 in. and 72 in., recently developed by the Betts company, was described in THE IRON AGE, issue of April 29, page 1222.

Utilization of Superheated Steam

Superheaters and the utilization of superheated steam were discussed in a paper presented by D. D. Pendleton, sales engineer Locomotive Superheater Co., Pittsburgh, and C. A. Brandt, chief engineer Locomotive Superheater Co., New York, before a recent meeting of the Engineers' Society of Western Pennsylvania. The paper points out the rapid increase in the use of highly superheated steam for locomotives and the awakening interest in the application of superheaters in marine service, also that it appears, however, that not over 10 per cent of the existing power plants are equipped with superheaters. Superheating in stationary plants, the authors state, offers the same opportunity for economy, per unit of power generated, as in locomotive and marine practice. "The increase in efficiency obtained by superheating is in nearly direct ratio to the degree of superheat used; at 100 deg. a saving of 8 to 10 per cent in fuel is possible, depending upon the boiler and engine construction; at 200 deg. superheat a saving of 18 per cent, or more, is possible. The increase in plant capacity by the use of superheaters is also a factor."

The paper explains that the increased economy is effected, in general, in four ways—by increasing boiler efficiency, by reducing condensation losses in steam lines, by reducing the steam consumption of the prime mover, and by increasing the capacity of the plant—and explains these points in detail.

In the discussion of the paper, W. E. Snyder, mechanical engineer American Steel & Wire Co., Pittsburgh, agreed with the points made by the authors as to the advisability of using superheated steam with steam turbines and locomotives. Their general adoption, however, in existing boiler plants embodying old equipment, he said, is a matter which must be approached with great care. Usually it is not a simple matter that can be figured out with pencil and paper, and the actual results obtained are not always as good as anticipated. In corroboration of this Mr. Snyder presented results that had been obtained in a number of installations where superheated steam was used, and discussed in detail the use of superheat in old piping systems with cast-iron valves and fittings.

Data and figures showing what had been accomplished by superheating in a number of cases were given by John Primrose, chief engineer Power Specialty Co., New York. Examples of the abuse of superheaters were given by F. M. Van Deventer, engineer National Tube Co., Pittsburgh. Lack of thoroughness in providing for the care of superheaters and lack of co-ordination with the boiler and piping lay-out, he said, are probably more common than realized, particularly in small plants where thermometers and gages are usually lacking. He discussed in detail the heat loss from superheated steam and saturated steam in pipes, and the pressure lost during transmission through pipes. While superheated steam usually effects better economy and should be given serious consideration for all purposes, Mr. Van Deventer said, there are limitations to its use and each problem should be analyzed and treated according to its particular conditions and merits, taking due account of the steam system as a whole.

The discussion then branched out into a consideration of desuperheating, several ways of accomplishing this being discussed. A copy of the paper together with the discussion can doubtless be had by addressing the secretary of the society, Union Arcade Building, Pittsburgh.

New Classification of Scrap

Briggs & Turivas, Inc., Westminster Building, Chicago, dealers in scrap iron and steel and salvaged material, with branch offices in New York and Toronto, has issued a booklet entitled "Classified Scrap Iron," containing a new classification of scrap, based on business experience and free from technicalities in definition. A table shows weights and quantities of rails and accessories in various combinations of tonnage and length of track. Other tables show net and gross ton equivalents, a tonnage card, weights of plates according to thickness, standard gages in sheets, plates, wire, etc., and specific gravities and weights of metals and other materials. The book is arranged for convenient reference and was designed to answer questions which often arise in the scrap handling industry.

Wage Conference of Sheet and Tin Mills at Atlantic City

The annual wage conference to arrange a scale for sheet and tin mills opened June 8 at Atlantic City between representatives of the Amalgamated Association of Iron, Steel and Tin Workers, for the employees, and the Western Bar Iron Association and the Western Sheet and Tinplate Manufacturers Association, for the employers. The agreement governing wages in rolling mills which has been in effect the past year expires June 30.

James H. Nutt, secretary of the two manufacturers associations; C. B. Cushwa, general manager of the Brier Hill Steel Co., and A. N. Flora, vice-president of the Trumbull Steel Co., are among the representatives of the manufacturers in attendance. M. F. Tighe, president of the Amalgamated and delegates from the various lodges which comprise the organization are present for the workers.

At its recent annual convention in Scranton, Pa., the Amalgamated Association, through its wage committee, formulated a scale which is an approximate advance of 20 per cent over the base rate provided in the 1919-20 agreement, and also requests a helper for the catchers as an additional workman in the regular sheet mill crews. These requests have been referred to the manufacturers wage committee, which has had them under advisement.

While it is likely there will be some readjustments in the base rate for various members of the crew, it is altogether unlikely that the manufacturers will accede to the requested increase in the base. It is pointed out that sheet workers are paid 87 per cent above the base for the May-June period, the rate being based upon an average invoiced selling price of 26, 27 and 28-gage black sheets of $5.05 per 100 lb. Tin mill employees are paid 78 per cent above the base, their wages being adjusted at the last two bi-monthly settlements on an average selling price of tinplate of $7.40 per base box. With a rate of $14.88 per ton for May and June, boilers are being paid 170 per cent above the base of $5.50.

The One Big Union Idea

MILWAUKEE, WIS., June 8.—A movement toward industrial unionism in the metal trades industry has been initiated by organized railroad and contract shop machinists of Milwaukee, who are circularizing the entire membership of the International Association of Machinists with a proposition to have the organization break down its craft lines and go out after all workers in the general machine shop industry. This movement, it is stated, is to force action on a stand taken by the organization in 1914 when by a referendum vote members indorsed amalgamation. The last attempt, in June, last, during the convention of the metal trades department of the American Federation of Labor, was unsuccessful. The underlying idea is to form one large union of all metal trades workers in the machine shop industry. This is to be effected when the national convention of machinists meets at Rochester, on Sept. 20. It is generally regarded as one of the most pretentious and significant union movements ever undertaken in this country.

Some Men Laid Off

DETROIT, June 7.—Little change has been manifested in labor conditions in Detroit during the last week or so. The motor car companies continue to lay off a few men at a time, but the slack seems to be taken up elsewhere and the labor supply remains about stationary. Wages continue their downward tendency wherever any hiring is done.

The only thing that appears to be stirring in labor circles is the action of the Detroit Federation of Labor, which has petitioned the American Federation of Labor to use its disciplinary powers to compel W. D. Mahon, president of the Amalgamated Street and Electric Railway Employees, to "have greater respect for the name of organized labor and to conduct his private business and his dealings with labor so as not to interfere with the legitimate workings of labor organizations."

A resolution to this effect was sent to the Washington headquarters of the American Federation of Labor as the result of a dispute of long standing between R. C. Mahon, son of W. D. Mahon and president of the R. C. Mahon Co. of Detroit, sheet metal contractor, and the Sheet Metal Workers' Union. The Detroit Federation of Labor says the elder Mahon has been a party to this controversy by reason of his son's enterprise. Mr. Mahon denies this.

Westinghouse Employees' Store a Success

Nearly $250,000 in cash sales was handled by the employees store of the Westinghouse Electric & Mfg. Co., East Pittsburgh, in the first five and one-half months of its existence. According to a report just issued by J. E. Bonham, secretary-treasurer of the co-operative buying committee of employees, the total sales amounted to $226,673.02. After expenses for the period were deducted there remained a surplus of $11,550.90, which is being used as a working fund. The employees store has been in operation since Oct. 18, 1919, selling merchandise practically at cost to workers. It is the intention to enlarge the capacity as the patronage of the employees warrants.

In the Field of Labor

The Rock Island Arsenal, Rock Island, Ill., laid off 5800 men on June 1, in compliance with the Government's decision for a permanent reduction of force.

To create an athletic field and community center for its employees and their families, the Truscon Steel Co. has purchased a parcel of land comprising several acres adjacent to its main plant in Youngstown, Ohio. The athletic grounds will be fitted for baseball, football, tennis, handball, volley ball and track athletics. A playground for children will also be provided and adequately equipped. This development is under the company's welfare department.

The United Brass & Aluminum Mfg. Co., Port Huron, Mich., has organized a "pep club" among its employees. The object is promotion of good fellowship between employer and employee and to bring about discussions among the employees on matters that will tend to help the company as well as the men.

About 200 molders employed by the General Electric Co., West Lynn, Mass., struck June 4 in sympathy with a walkout by molders employed by the company at Erie and Schenectady. By so doing the men lose pensions, bonuses and other concessions which the West Lynn plant grants to employees who remain loyal.

The report for 1919 of the trustees of the Fairbanks, Morse pension fund shows eight members pensioned, death benefits of $11,675, and net resources of $505,000, practically all invested in high grade bonds. The fund was established Jan. 1, 1917, by Fairbanks, Morse & Co., Chicago, and at the close of 1919 had 1139 contributing members.

By a vote of 618 to 46 the Chamber of Commerce of Zanesville, Ohio, approved the "open shop" principle to foster and protect the business and industrial interests of the city.

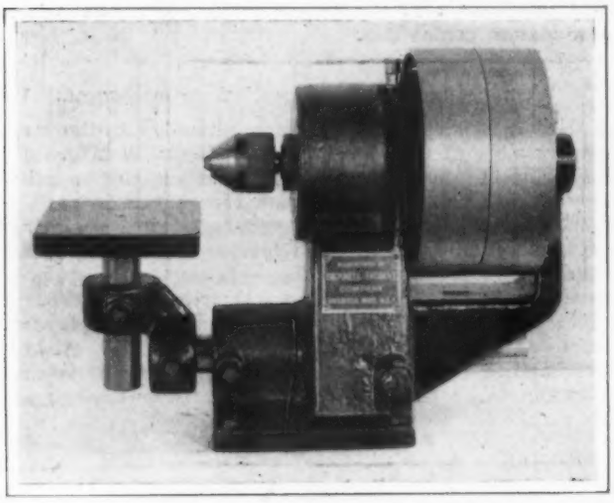
The Clark Brothers Bolt Co., Southington, Conn., has taken out a group insurance policy for its 175 employees, covering sickness. No life clause is attached to the policy.

According to the United States Consul at Tiflis there was no production of manganese ore in the Caucasus in 1918 and 1919. The only export recorded was 1600 tons to England in December, 1919. Manganese constitutes at present a government monopoly, and its exportation is possible only by special agreement, hence the stagnation of trade.

The General Steel Products Co., of Detroit, has just moved its offices from the Dime Bank building to the Garfield building, 870 Woodward Avenue.

Plain Tapping Machine

A small plain bench machine has been added to its line of tapping machines by the Bicknell-Thomas Co., Greenfield, Mass. The machine is furnished with either friction or positive drive, inside the head of the machine, the friction drive having a capacity to 3-16-in. tap and the positive drive a capacity to ⅜-in. tap.



Bench Tapping Machine Made with Friction or Positive Drive Having a Capacity to ¼-in. Tap and ⅜-in. Tap Respectively

The driving pulleys are 6 in. in diameter for 1½-in. belt.

The work table slides on a steel shaft, which is held in position by a pilot screw in the keyway. The work table is adjustable and can be removed and special work-holding fixture used in its place. It has an adjustable stop, which insures the tapping of the holes to a uniform depth.

Cracks in Heavy Steel Rolls

K. Meerbach draws attention in *Stahl und Eisen*, Jan. 29, 1920, to a number of cases in which cracks have been formed on the surface and in the interior of steel rolls used in rolling mills, and which in several instances led to fracture of the roll in service, according to an abstract in *Technical Review*, London. The rolls in question were used in a slab mill for rolling down ingots of 8 to 12 tons. The rolls were either cast or forged steel, and the composition aimed at in their manufacture was as follows:

	Per Cent		Per Cent
C	0.25–0.35	P	Within 0.06
Mn	0.50–0.70	S	Within 0.06
Si	0.10–0.20		

Every effort was made to keep down mechanical stresses (bending and torsional stresses set up during rolling) by making the rolls of sufficiently large dimensions and selecting a material tough enough to withstand high rolling temperatures and reduction ratios.

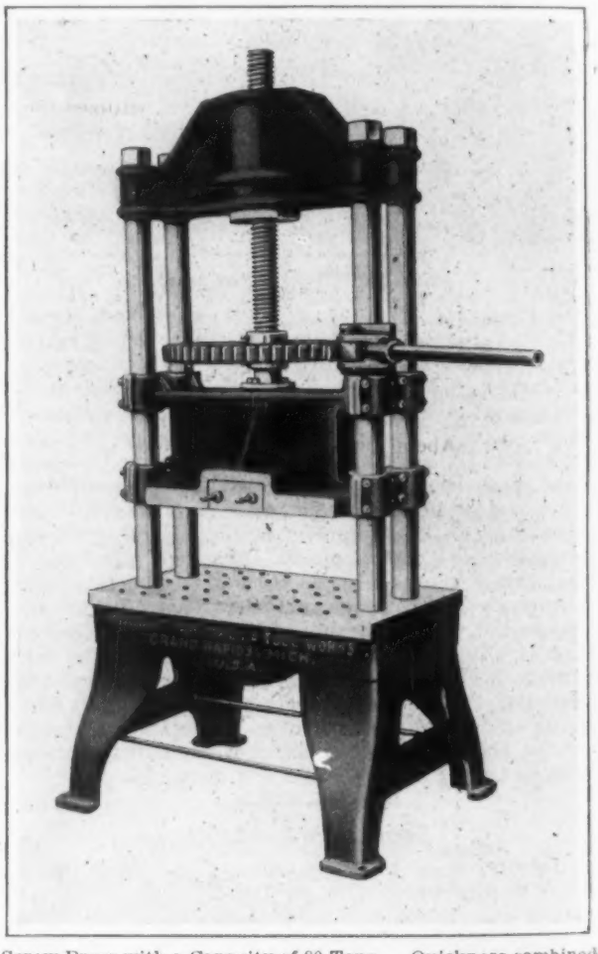
Precautions were taken wherever possible to carefully heat the rolls through, especially after they had stood idle for a long time and in cold weather. The ingot was not allowed to stand too long in the rolls and so cause local overheating, though this was sometimes unavoidable. The rolling process was also as far as possible carried out in regular sequence, and suitable means of cooling adopted.

The cracks which formed were of different character, some running in straight lines along and across the roll. These occurred especially in unannealed and therefore brittle material. In two of these cases fracture of the roll resulted. The carbon content was 0.34 to 0.31 per cent. Another roll (still in use) showed cracks which formed at right angles to each other, but with a number of branch cracks, the transverse cracks being very slight. These are not so dangerous. In still other cases the cracks were markedly arborescent in appearance, and the rolls fractured owing to internal cracking. The steel in this case was properly annealed and had a normal carbon content of 0.30 per cent. The author also mentions frequent cases of surface cracks due to burning after the rolls had been in use a considerable time.

Exhaustive chemical and microscopic examinations were carried out on a number of the cracked rolls, but the author is unable to state positively the precise cause of cracking. He states that it is possible the cracks can be divided into three classes according to the manner in which they occur. In the first class brittleness is the cause, due to the unsuitable chemical composition or insufficient annealing. In the second category (surface cracks), their formation is due to thermal stresses set up in the metal, the cracks gradually progressing into the inside of roll. The third class comprises those cracks which existed initially in the interior of the roll. The writer believes them to be caused by lack of cohesion in the interior of the roll due to cooling in the mold, thus giving rise to piping or similar phenomena.

Four-Post Screw Press

The four-post screw press, shown in the accompanying illustration, is a recent product of the Manhattan Machine & Tool Works, Grand Rapids, Mich. The design is emphasized as giving a proper balance of parts and as providing convenience for facilitating quick work combined with simplicity of operation. The machine is designed to accommodate the heavier class of work and has a capacity of 80 tons. The bed is



Screw Press with a Capacity of 80 Tons. Quickness combined with simplicity of operation are emphasized as features

20x36 in. and there is a space between standards of 26 in.

Other specifications are as follows: Floor space 31x41 in., height over all 77 in., height to top of bed 24 in., diameter of standards 3 in., maximum height from bed to ram 22 in., thickness of ram 14 in., thickness of bed 8¾ in., diameter of screw 3 in., diameter of hand screw 23 in., and diameter of punch shank 1½ to 3 in. The net weight is 2270 lb.

SLOWLY RESUMING

Production in the Valleys Increasing—Shortage of Cars Still Serious

YOUNGSTOWN, OHIO, June 8.—Maintenance of industrial operations is wholly dependent upon transportation conditions which are still only sporadically adequate. While operations are slowly climbing, conditions in the Mahoning and Shenango Valleys are far from a normal basis. Lack of cars to ship product is now the most serious handicap. The week started with 18 active blast furnaces in the Mahoning Valley, out of a total of 25, the last to go in blast being No. 1 in the Hubbard group of the Youngstown Sheet & Tube Co. Of 66 open-hearth furnaces in the Valley, only 14 are idle. Republic Iron & Steel Co., Trumbull Steel Co., Sharon Steel Hoop Co. and Brier Hill Steel Co. are operating their steel plants close to normal. Warehouses are still clogged with material and only such product as has been affected by priority promulgation, such as tin plate, is moving in large tonnages. About 800 cars of tin plate were ready for shipment in the two Valleys when the priority ruling was issued. The principal shipments prior to the ruling were made in trainload lots and in refrigerator cars bound west. Schedules on the whole are better than two-thirds of normal.

The leading producer of rods, nails, wire and wire products is practically out of the market until the fourth quarter, though inquiries continue active. The company is unable, however, to make satisfactory deliveries to regular customers.

Evidencing the car stringency is the fact that buyers of wire products, unable to secure box cars, have had improvised wooden tops built over gondolas and other open-top type cars, and makers have utilized these in shipments, the buyer, of course, paying the added cost.

In their urgency for deliveries, consumers of sheets and tin plate have come into the district, secured from the railroads box cars on sidings and have trucked material from the plants to the cars.

Plate Demand Declines

There has been considerable decrease in demand for plates of all grades, and the prevailing quotation is 3.50c.

In the sheet trade, the principal factor is the insistence of consumers upon deliveries in the face of the lack of cars. About the only spot business is being done by jobbers, and they too are checked by transportation difficulties. It is expected prices will continue firm for an indefinite period, but there is an apparent absence of premium bidding that characterized the market earlier in the year. Sheet production is getting on a more nearly normal basis. The spread on one-pass black is from 7.50c. to 9c. One jobber states blue annealed has been offered at 6.50c. for October rolling by a certain maker.

The whole industrial situation revolves around the ability of the railroads to make shipments, and to date they have failed to make heavy inroads into the accumulated tonnage. It is estimated 6,500 cars are needed to move 325,000 tons of steel in this district, while the available supply of empty cars is but 5 per cent of normal. This condition will become worse as the plants increase production and is certain to retard output.

Traffic reports indicate that the fuel supply is adequate for day-to-day operation. For instance, at the end of last week there were 1,496 cars of coal on track and 581 inside the industries, or nearly double the tonnage necessary for 100 per cent per day operation, in addition to 441 cars of coal for Lake destination.

Slow Ore Movement

Inbound ore shipments from Lake ports are also reduced by lack of cars and furnaces are consuming on an average a larger tonnage than is being shipped in. They are compelled, therefore, to draw upon stocks. As a rule, at this season of the year, ore is moving into the furnace yards in large tonnages to replenish depleted piles in preparation for the winter. Furnace operators expect interference with metal output unless the inbound movement shows a decided improvement.

The Carnegie Steel Co. has four of its six stacks at the Ohio Works on the active list. No. 6 is down for relining and overhauling. The open-hearth department is operating about 50 per cent.

The Sheet & Tube company has added a fourth group of by-product coke ovens of 51 units each. Two units are still idle. Operations are about two-thirds of normal. The Republic Iron & Steel Co. placed two additional pipe mills in commission this week and the 12-in. bar mill at the Brown-Bonnell works. Last week the blast was turned on another blast furnace at Haselton.

The Brier Hill Steel Co. is operating all three of its blast furnaces and its finishing mills about 80 per cent of normal.

The Falcon Steel Co. continues to produce on a curtailed basis on all its sheet units at its Niles plant.

In the Shenango Valley, the Sharon Steel Hoop Co. was preparing to start this week its eight and nine-in. mills at the Sharon plant. Mercer works of the American Sheet & Tin Plate Co. has resumed. President John Stevenson states that the Standard Tank Car Co. broke all of its production records in May by turning out 750 tank cars. Moreover, it expects to produce 800 in June.

More Coke Ovens

One large blast furnace operator in the Mahoning Valley, whose plant is located at Youngstown, is planning construction of a battery of by-product coke ovens. The furnaces now consume bee-hive coke shipped largely from the Connellsville region. Whether construction will start this year or not depends upon transportation and labor conditions.

The plant of the Youngstown Pressed Steel Co. at Warren is nearing completion and will be ready for production within a short time. It is one of the most modern plants in this territory, elaborate provisions having been made to afford an abundance of natural light.

In the semi-finished market, makers have made some progress in filling sheet bar contracts, utilizing capacity ordinarily devoted to slabs and billets. Idleness of finishing units and the lack of coal to reheat billets rendered this change advisable. There is no change in sheet bar quotations, open-hearth ranging from $75 to $80 and Bessemer sheet bars from $70 to $75.

The new tube mill being built by the Youngstown Sheet & Tube Co. to roll larger sizes of pipe will be delayed over a month in completion and will not likely be ready for production until midsummer.

Opposed to Priority Orders

The directors of the Illinois Manufacturers' Association have sent a telegram to the Interstate Commerce Commission and the president of the American Railroad Association opposing the adoption of a priority plan of handling freight. "Past experience," the telegram states, "has demonstrated that general Governmental orders given to common carriers cannot be so drawn but that when literally carried out, great hardships will result. We, therefore, recommend that as few of these be drawn up as possible and that the individual initiative of the carriers' officials be used to the greatest possible extent. We hope the wartime priorities will not be resorted to, because this is a country of equal rights and equal opportunity and such orders should only be issued as last resort to prevent a national catastrophe."

Valuable suggestions on what may be registered as a trademark and what not and other features of the trademark question are given in an entertaining and instructive brochure entitled "Chasing Trademark Rainbows," by Lee W. Mida, president Mida's Trademark Bureau, Rand-McNally Building, Chicago.

The Acid Open-Hearth Process

The Practice at Bethlehem—Comparison with the Electric Process, both Acid and Basic — Silicon from the Slag

THREE discussions of the paper, "The Acid Open-Hearth Process," presented at the spring meeting of the American Iron and Steel Institute, May 28, in New York and abstracted in THE IRON AGE, June 3, are given nearly in full below.

Practice at the Bethlehem Steel Co.

*Discussion by S. S. Ball**

As stated by Mr. de Maré, it is an accepted fact that steel made by the acid open-hearth process is superior to that made by the basic open-hearth process. But there is a question in the minds of many whether it would not be possible to make steel by the latter process equal in quality to that made by the acid process. A like amount of time and study has not been spent in the development and perfection of basic practice. It is probable that if a basic furnace bottom could be built which would stand up as well as the acid furnace bottom, permitting long hours of slow refining at high temperatures, with careful conditioning of the slag, a basic steel equal in quality to acid steel could be produced. Basic open-hearth steel as made by the present methods, carries more oxides than acid open-hearth steel and a larger amount of deoxidizers must be added to the former to prevent a blowey condition of the ingot.

An experiment which demonstrated this fact clearly, was tried at Bethlehem some years ago and is confirmed by Mr. de Maré's experience with blocks sliced from tire ingots. Test ingots, 4 in. x 4 in. x 12 in. were case, in iron molds, from each of 25 basic open-hearth and 25 acid open-hearth soft steel heats for steel castings. These test ingots were nicked in the middle on two sides and broken so as to give a cross-sectional fracture. Preliminary experiments showed that the solidity of the test ingot was greatly affected by the temperature of the mold and the rate of pouring, a cold mold and a slow rate of pour being conducive to the formation of blowholes. Therefore in the main experiment, which was to determine the amount of deoxidizers necessary to assure solid metal in steel castings, all test ingots were cast in cold molds at a relatively slow rate of pour.

The conclusion arrived at, after an examination of the fractures of the test ingots from both the acid and basic heats, was that, for a 4 in. x 4 in. section chilled in an iron mold, there should be present a minimum of 0.28 per cent silicon for basic steel and 0.23 per cent silicon for acid steel. This of course applies to the particular grade of steel employed in this experiment. On the strength of this conclusion, it would seem that 0.35 per cent silicon for basic steel and 0.30 per cent silicon for acid steel should be sufficient to insure soundness in steel castings under normal conditions.

This experiment is pertinent to the subject under discussion in that it shows that acid steel as it comes from the furnace contains less oxides than basic steel.

Furnace Design and Fuels

In referring to the matter of furnace design, it might be well to emphasize the advantage and importance of carrying a very high furnace roof as pointed out by Mr. de Maré. This is especially advantageous for liquid fuels such as oil and tar, and applies to basic furnace design as well as to acid furnace design, particularly where the furnace is short and of small capacity.

Oil is by far a better fuel for the refining operation than either tar or producer gas, because the metal can be gotten to a higher temperature and kept in better control. Tar is a better and cheaper fuel than oil for melting down the charge, but cannot be used satisfactorily for refining, due to the highly oxidizing action resulting from the use of steam for atomizing.

Steps in Manufacture of a Heat

The furnace practice at Bethlehem is practically identical with the practice as described in detail by Mr. de Maré in the review of heat M.K.13-125, and I am personally in hearty agreement with the theory which the author advances to support the importance of certain steps in the manufacture of this heat.

In the use of limestone it has proved to be a very good practice to so work the heat that the steel will contain the desired amount of impregnated silicon about an hour before the carbon content has dropped low enough for the final additions, and then to stop the reduction of silicon from the slag by the careful addition of limestone. A practical demonstration of the value of this step is shown by a hot-spoon test. If a test spoon is heated, slagged and a sample of steel covered with slag drawn from the furnace, and the contents allowed to cool slowly and undisturbed, this sample when examined will show a beautiful, smooth surface, and an entire absence of pot-marks, or other indications of the presence of gas in the steel. In such a sample there cannot be any appreciable amount of oxide of iron (FeO.)

As stated by Mr. de Maré, it is bad practice to have the decarburization proceed so fast that the carbon is lower than desired when the bath is finally well settled. In instances where too rapid decarburization has a tendency to occur, we have found it advisable to check this action by additions of washed metal to the bath. Also, when, for some unavoidable reason the heat cannot be tapped out at the proper time, it has been found that the steel suffers no ill effect if an addition of washed metal is made as a recarburizer before the fuel and air are shut off. Since washed metal is a combination of iron and carbon with very little phosphorus and sulphur, and no manganese or silicon, its addition causes no reaction to take place in the bath unless the quantity added is such as to lower appreciably the temperature of the bath. The time that it is allowed in the furnace after the addition is made is sufficient to permit the rising to the slag of any mechanically entrained impurities.

Theory of the Reduction of Silicon from the Slag

Some steel makers offer the opinion that iron rather than carbon acts to reduce silicon from the slag. In their opinion iron must be a far more powerful reducing agent than carbon. It is present in great excess and at high temperatures shows a great affinity for oxygen, as is clearly indicated by the heavy brown fumes of iron oxide which rise from the surface of very hot steel when it is exposed to the air. It is an established fact that oxygen has a greater affinity for silicon than for carbon in the open-hearth furnace at ordinary temperatures. For carbon to reduce silicon according to the equation $SiO_2 + 2\,C = Si + 2\,CO$ this affinity would be reversed. Furthermore, a reduction of 0.07 per cent silicon from the slag by carbon would entail a loss of 0.06 per cent carbon from the metal.

As a rule, however, analyses show that the loss in carbon is less than normal whenever there is a considerable gain in silicon in the metal. It therefore seems feasible to believe that the reduction of SiO_2 is brought about by iron according to the equation

$$SiO_2 + Fe = Fe\,Si + O_2$$

The oxygen evolved as a result of this reaction would account for the characteristic worm-holes which are found in the test samples while the reduction is taking place. By halting the reaction through the

*Bethlehem Steel Co., Bethlehem, Pa.

careful addition of limestone, the evolution of the oxygen can be stopped and a solid test piece obtained.

Acid and Basic Electric Steel

*Discussion by R. F. Flintermann**

What has been said of the superior quality of acid open-hearth over basic open-hearth steel is so generally accepted that it needs no further emphasis. Since I am interested in the manufacture of electric steel, it is only natural that I should want to compare electric steel with acid open-hearth steel.

The author makes this statement: "The amount of deoxidizing finals; just sufficient to produce an acid ingot free from blow holes is not sufficient to make a basic ingot of similar composition solid." I do not believe that this statement would be true of electric basic steel. We have the advantage in the electric basic process of being able to thoroughly deoxidize by means of the slag so that the steel will be free from oxides even before adding finals.

But even so, I believe acid electric steel to be better than basic electric steel, but to my mind the superiority lies not in any differing amounts of oxides present in the steel, but rather in the fact that basic slag is not as completely separated from the metal as is the case with acid slag and acid electric steel.

This superiority would not appear in the results obtained from physical tests on longitudinal bars taken in the ordinary way. But on transverse or tangential bars, with even very slight particles of slag present, the structure would be sufficiently broken up to affect the psysical strength. In other words, where a very high grade steel is to be made and when such steel must meet very exacting specifications and tests, I should still prefer acid electric steel over basic electric steel for the reason just set forth.

The same care must be used in adding ore in the electric furnace as pointed out by the author. The necessary temperature must have been reached before ore is added, otherwise the reaction is delayed and when it does begin the boiling is very violent and the reduction of carbon is carried beyond desired point.

The acid open-hearth process has rather an advantage over the acid electric furnace at this point, since the carbon reduction by means of ore need not be carried to the actual "go-ahead" carbon point desired, since the air entering with the fuel will further reduce carbon and the other reactions during the period of attaining proper temperature will aid in allowing carbon to drift to the desired point.

In the acid electric furnace the ore calculation and additions must be carefully made since this is the only reagent we have to depend on. If the temperature is right, carbon, manganese and silicon will decrease rapidly as shown by curves. Manganese and silicon will from this point act much as shown by the chart. The carbon, however, will tend to build up. This is due to the fact that the silica, taken from sides and bottom, is thickening the slag very fast. The electrode ends are engulfed in this slag and carbon monoxide formed by burning of electrodes is held in close contact with metal and partially absorbed. At this point lime mixed with coal dust is added. The lime will help to thin the slag and the more fluid slag will allow coal dust to react more freely in deoxidizing the slag, and at the same time the fluid slag prevents the heavy envelope around the electrodes, allows the gas formed to escape more freely and thus prevents the possible rapid building up of carbon in the metal.

Factors in Success of an Electric Heat

The greatest care must be used by furnace operator during the deoxidizing period and the complete success of the heat depends upon his being able to accomplish and finish simultaneously these three things:

1. Complete deoxidizing of steel.
2. Attaining proper metal analysis.
3. Attaining proper pouring temperature.

If these three desired goals are reached simultaneously, finals can now be added and heat tapped. If, however, the finish of the operation is delayed because any one of the three points has not been attained, the delay will be attended with much difficulty because of a pasty unwieldly slag and constantly increasing carbon and silicon content in the steel.

Before I conclude this comparison, I wish to point out one similarity which the author emphasizes and which we demand in our process, namely, the attaining of a temperature to obtain complete deoxidation in the bath, even though in the case of the author's heat, the temperature attained was too high to pour and metal was held as he has described. This latter condition would never obtain in our case, since we require a very hot metal in order to pour the light castings which we make. Occasionally we have to make a heavy casting which takes all the metal from one heat, and we find that we always obtain better results by carrying our temperature up to the same high point that we aim at when producing our regular line of small castings. Our practice differs, however, from the process Mr. de Maré describes in that we tap one heat and allow cooking to take place in the ladle. This procedure is made necessary because of the reason already pointed out, namely, that the slag becomes thick and unwieldy and both metal and slag should be removed at once.

In closing, I will refer to one interesting statement which the author makes about the addition of aluminum for deoxidizing, and "the baneful effect of such additions upon physical properties." The decreased strength of steel, where aluminum is used, is due to presence of aluminum oxide, which has the unhappy faculty of remaining distributed among the metal mass and refusing to rise with the slag.

In making electric motor housings with carbon and manganese under 0.10 per cent it is customary to cut out the usual final additions and use aluminum instead. Since many of the motor housings that we make are used on motor vehicles and subjected to shock, there is always danger of breakage and the aluminum additions must be held to a minimum.

Two Questions Raised

*Discussion by Lanford H. Fry**

Mr. de Maré's paper puts before us an ideal example of good practice in steel making. It would be interesting to know the concrete results to be obtained by living up to it. During the war, when many open-hearth furnaces were set to making gun steel for the first time, the ordnance experts, of whom many were well versed in Midvale practice, urged on the newcomers a practice very similar to that described and particularly urged that the melt be handled so as to be in a condition to pick up silicon from the slag in the latter stages. It is interesting to note that in Mr. de Maré's heat no silicon addition is made, all of the final silicon being residual.

The author speaks of the silica of the slag being reduced by the carbon of the bath. Is there direct evidence of this? The question is asked because in a paper before the British Iron and Steel Institute presented early this month, Messrs. Yaneske and Wood offer a good deal of evidence to show that the reduction of the silica is effected by the iron and not by the carbon.

Mr. de Maré's paper suggests two questions. The first arises out of the statement that the ingot crystals are larger in basic than in acid steel. Is this due to the fact that in the melts compared the basic has more inclusions, or is it an inherent property of the steel? In the latter case more information would be welcome.

The second question is: If two melts, one acid and one basic, be made from the same stock, using the same care in melting practice, with the proper additions in each case and proper teeming to eliminate the by-products of the additions, can Mr. de Maré show definitely the difference which would be found in the physical properties of the two melts. Would there be a difference in grain size and what effect would this have on the characteristics of the steel after working?

Many a superintendent will put the log of heat M. K. 13-186 in his melters' hands and quoting Luke x : 37 will say, "Go thou and do likewise."

*President Michigan Steel Casting Co., Detroit.

*Standard Steel Works Co., Burnham, Pa.

Marked Decline in Iron and Steel Exports

Railroad Troubles and Exchange Conditions Have Decided Effect on Movement to Other Lands—Import Figures Show Increase

WASHINGTON, June 8.—The traffic demoralization in the United States and exchange demoralization in Europe brought the rising tide of iron and steel exports to an abrupt halt in April, according to the statistics for that month, compiled by the Department of Commerce. The exports of iron and steel showed a marked slackening in tonnage as well as in value. The import figures for the month reveal an increase in both tonnage and values, but these figures, in comparison with the exports, are of far less importance. Exports of the various manufactures of iron and steel during April, 1920, totaled $87,496,643, against $94,756,383 in March, 1920, and $88,897,425 in April, 1919. For the ten months period ending with April, the slump is far more marked, dropping to $774,341,953, against $857,085,745 for the corresponding 10 months of 1919.

Imports of Iron and Steel
Gross Tons

	April		Ten Months	
	1919	1920	1919	1920
Ferromanganese	4,301	3,018	22,206	29,298
Ferrosilicon	142	633	5,635	13,820
All other pig iron	646	12,109	2,180	100,933
Scrap, including tin plate scrap	9,174	7,818	80,084	184,105
Bar iron	10	179	1,226	2,641
Structural iron and steel	55	136	2,277	958
Steel billets without alloys	1	2,428	21,647	21,551
All other steel billets	402	289	4,918	3,005
Steel rails	1,623	2,742	10,116	10,569
Sheets and plates	140	192	626	1,182
Tin and terne plates	47	29	48	312
Wire rods	20	109	1,956	688
Total	16,561	29,682	151,913	369,062
Manganese ore and oxide of	59,470	35,088	421,258	186,986

The tonnage of the exports of iron and steel in April, 1920, slumped below the 400,000 mark to 395,120 gross tons. In March, 1920, this figure was 417,216 tons, while the April, 1919, total was 408,248. Here again the 10 months aggregate dropped almost 25 per cent. For the 10 months ending April, 1920, the total was 3,401,136, while during the same 10 months of a year ago, the total was 4,326,228. The slump was a general one, although five items revealed an increase in comparison with the figures of a year ago.

Exports, January, 1919, to April, 1920
Gross Tons

	All Iron and Steel	Pig Iron	Semi-finished Material
January, 1919	360,456	35,793	11,594
February	234,793	20,178	10,407
March	344,506	22,054	8,176
April	408,204	16,300	11,488
May	447,050	32,233	20,771
June	544,580	39,540	46,016
July	287,823	38,373	21,318
August	396,743	36,071	36,162
September	363,505	18,991	37,513
October	302,456	14,108	20,713
November	295,045	21,429	13,211
December	254,676	14,612	21,538
Total	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032

Steel bars were exported to the extent of 48,895 gross tons in April, 1920, against 39,360 in April, 1919; and 58,862 in March, 1920.

Billets, ingots and blooms showed an export total of 19,032 tons, against 11,488 in April, 1919, and 30,444 in March, 1920. Of the April, 1920, exports of this commodity, the United Kingdom received 9604 tons, against 3691 in April, 1919; Italy received 3924 tons, against 1736 a year ago; while France, which bought 3427 tons in April, 1919, received none at all in April, 1920.

The exports of tin and terne plate totaled 23,058 gross tons in April, 1920, 19,101 in April, 1919, and 21,498 in March, 1920. Japan bought much the largest share of tin and terne plate in 1920, receiving 8319 tons. Canada's share was 4068 tons, and Australia received 2560 tons.

The outgo of steel plates showed one of the weakest spots in the April export figures. A year ago, the April total showed an exportation of 92,722 tons of these plates against 76,248 for April, 1920, of which Japan received 26,957 tons; Canada 18,495; the United Kingdom, 4712; and Italy 4479. The exports in March, 1920, were 74,468 tons.

Steel sheets dropped from 16,339 tons in April, 1919, to 13,607 in April, 1920. Of the latter figure Japan was again the leading consumer, receiving 8225 tons; Canada was second with a purchase of 2231 tons. In March, 1920, the exportation of this commodity was 12,730 tons.

Exports of Iron and Steel
Gross Tons

	April		Ten Months	
	1919	1920	1919	1920
Ferromanganese	441	33	1,509	1,965
Ferrosilicon	297	....	3,552	333
All other pig iron	16,300	14,575	263,506	216,793
Scrap	442	5,468	1,968	37,904
Bar iron	5,870	3,131	73,528	29,689
Wire rods	13,364	11,864	125,521	87,253
Steel bars	39,620	48,895	393,468	466,877
Billets, ingots and blooms, n.e.s	11,488	19,032	844,908	242,585
Bolts and nuts	4,711	3,938	22,036	28,221
Hoops and bands	4,496	4,831	46,768	36,028
Horseshoes	360	35	1,643	1,975
Cut nails	175	147	2,890	3,446
Wire nails	8,767	6,445	71,992	50,020
All other nails, including tacks	1,456	81	14,345	6,904
Cast-iron pipes and fittings	3,987	4,754	31,945	36,561
Wrought pipes and fittings	26,717	23,887	118,563	177,966
Radiators and cast-iron house-heating boilers	303	482	2,788	5,943
Railroad spikes	3,482	1,747	13,440	14,188
Steel rails	60,463	46,564	478,578	445,875
Galvanized sheets and plates	9,596	10,194	62,262	81,369
All other sheets and plates	2,923	1,567	212,784	27,795
Steel plates	92,722	76,248	615,369	585,561
Steel sheets	16,339	13,607	118,623	119,532
Ship plates punched and shaped	915	6,068	17,489	22,383
Structural iron and steel	42,550	36,904	254,332	272,528
Tin and terne plates	19,101	23,058	210,456	169,266
Barbed wire	6,074	14,034	177,295	100,280
All other wire	14,246	17,531	142,795	131,896
Total	408,248	395,120	4,326,228	3,401,136

Steel rails also followed the general downward trend. The April, 1920, export aggregated 46,564 tons, against 51,763 tons in March, 1920, and 60,463 in April, 1919. The figures by countries are exceedingly interesting here, because of the striking fluctuations. In April, 1919, France received 15,153 tons of rails, but dropped in April, 1920, to 1286 tons; Japan, on the other hand, received only 6375 tons a year ago and 17,549 in April of this year. Cuba increased her receipts from 7133 tons in April, 1919, to 10,325 tons in April, 1920. The Dutch East Indies proved one of the best customers in April, 1920, with a total of 3817 tons against 1219 tons a year ago.

Ship plates punched and shaped showed an export total of 6068 against 915 tons a year ago and 4715 in March, 1920.

Barbed wire exports aggregated 14,034 tons in April, 1919, and 13,507 tons in March, 1920.

The exportation of structural iron and steel aggregated 36,934 tons in April, 1920, against 42,550 in April, 1919, and 38,463 in March, 1920. Of this year's

Exports of Machinery

	April		Ten Months	
	1919	1920	1919	1920
Adding machines	$418,404	$472,563	$2,639,466	$3,184,007
Air compressing machinery	294,877	512,765	2,637,821	3,410,283
Brewers' machinery	80,411	31,906	145,261	263,494
Cash registers	370,262	628,695	1,582,783	4,429,756
Parts of	20,154	31,611	130,146	280,130
Concrete mixers	22,704	70,892	219,505	386,270
Cotton gins	60,753	51,187	239,757	207,020
Cream separators	119,471	93,646	797,006	900,438
Elevators and elevator machinery	206,989	165,253	2,148,486	1,632,202
Electric locomotives	55,006	100,419	278,458	972,572
Gas engines, stationary	48,870	53,491	463,842	643,440
Gasoline engines	3,618,144	3,943,469	28,572,776	26,163,292
Kerosene engines	653,922	762,607	7,506,705	7,677,940
Steam engines	2,395 062	4,641,344	22,310,281	34,952,500
All other engines	320,331	309,588	4,413,177	2,251,043
Boilers	507,973	491,246	4,844,214	5,434,755
Boiler tubes	1,009,125	405,022	7,059,927	3,596,219
All other parts of engines	3,141,232	1,653,947	22,035,722	18,158,237
Excavating machinery	15,942	67,091	745,394	1,187,292
Milling machinery, flour and grist	354,147	311,539	1,580,985	1,376,581
Laundry machinery, power	41,563	118,220	387,783	901,702
All other	49,944	57,385	275,965	388,499
Lawn mowers	26,167	31,662	289,681	300,278
Lathes	992,784	560,008	7,901,800	7,239,502
Other machine tools	1,561,565	1,229,819	10,807,506	10,504,906
Sharpening and grinding machines	607,005	334,269	5,192,139	3,700,018
All other metal working machinery	2,450,107	1,489,625	21,730,188	19,736,012
Meters, gas and water	64,934	69,851	518,774	595,015
Mining machinery, oil well	310,619	363,404	3,025,612	3,271,799
All other	654,194	660,170	7,573,117	7,235,551
Paper-mill machinery	224,889	206,024	1,929,770	2,356,776
Printing presses	344,825	549,697	2,026,729	4,776,935
Pumps and pumping machinery	720,018	1,098,020	5,744,865	8,332,125
Refrigerating and ice-making machinery	157,878	326,828	1,653,765	1,922,633
Road-making machinery	65,219	98,657	650,737	868,821
Sewing machines	833,227	1,508,421	9,390,283	11,770,427
Shoe machinery	207,785	113,562	1,548,388	2,211,751
Sugar-mill machinery	353,559	1,499,532	8,846,201	13,535,698
Textile machinery	1,171,196	1,438,432	8,445,172	5,224,119
Typesetting machines	413,596	325,622	2,403,018	300,669
Typewriting machines	1,582,001	2,391,307	8,715,295	17,115,123
Windmills	46,138	166,604	740,458	1,095,643
Wood-working machinery, saw mill	69,141	145,117	1,242,877	783,909
All other	182,033	181,236	1,137,265	2,752,855
All other machinery and parts of	6,604,150	7,490,151	45,523,448	63,643,795
Total	$33,448,316	$37,250,904	$268,052,542	$317,372,103

total the exports to Canada aggregated 10,381 tons; to Japan, 7186 tons; Cuba, 5458 tons, and to Argentina, 2189 tons.

The exports of pig iron in various forms aggregated 14,575 tons in April, 1920, against 16,300 in April, 1919, and 22,815 in March, 1920. Italy's share fell from 9333 tons in April, 1919, to 2650 tons in April, 1920; while the exports to Canada rose from 4363 tons a year ago to 5788 in April of the present year.

Machinery exports revealed an increase of almost 10 per cent—quite out of line with the other exportations. These figures rose to $37,250,904 in April, 1920, against $33,448,316 a year ago. But they were more than $4,000,000 below the March, 1920, total of $41,281,413. For the 10 months ending with April, 1920, these exports totaled $317,372,103, against $268,052,542 in April, 1919.

The exportation of engines and engine parts, covering all the various lines of gasoline, kerosene, steam and electrical engines, rose from $11,762,665 in April, 1919, to $12,361,133 in April, 1920.

The total exports of metal-working machinery of various classifications fell from $5,611,461 in April, 1919, to $3,613,721 in April, 1920.

The value of the exports of wire and the various manufactures of wire rose from $3,967,351 in April, 1919, to $4,603,519 in April, 1920.

The value of the structural iron and steel exports dropped from $3,427,638 in April, 1919, to $2,607,219 in April of this year.

The imports of iron and steel rose from 16,561 tons in April, 1919, to 29,682 in April, 1920. The latter figure, however, is far below the 38,375 tons imported in March, 1920. For the 10 months ending April, 1920, the increase was even more marked, aggregating 369,062 for the 10 months ending April, 1920, against 151,913 tons for the same 10 months a year ago. The value of the iron and steel imports rose from $1,930,591 in April, 1919, to $3,307,050 in April, 1920. For the 10 months ended April, 1919, these figures were $21,202,902, and for the 10 months of the current year $28,440,381.

The manganese imports aggregated 35,088 tons in April, 1920. In March, 1920, they were 18,970, and for April, 1919, they were 59,470. O. F. S.

Little Immigration Expected

YOUNGSTOWN, OHIO, June 7.—Foreign bankers and managers of steamship agencies say there will be little immigration to the United States this year from Central Europe and no large numbers of men will come to this country in search of employment. Common laborers in the steel industry are chiefly foreigners from middle European countries. Operating managers of mills are not counting on any accessions from this source to their plants this year in appreciable numbers.

The Youngstown Boiler & Tank Co., Youngstown, Ohio, plate construction designer, fabricator and builder of tanks, has increased its capital stock from $100,000 to $500,000, to provide additional working capital, and also to cover the cost of very large additions made by this company to its plant, which will about triple its capacity. The company has bought all the equipment to be installed in the additions and has work ahead for three or four months. The officials are J. P. Keene, president; W. R. Kirby, vice-president; W. H. Heywood, vice-president and treasurer; and Charles R. Vogel, secretary.

All claims against the Ordnance Department in the Chicago district have been finally settled. The claims board, which has been on duty since February, 1919, has completed its work, except to make checks for contracts still in process of settlement in Washington. The total value of contracts in the Chicago district during the war was $387,700,000.

The labor situation at Waterbury and Seymour, Conn., continues unsettled. Industries at those centers are either closed or operating on greatly reduced schedule, and evidently are prepared to continue as they are until labor makes up its mind to return to work.

The Ordnance Department, Boston, offers for sale by negotiation 372,000 lb. 1⅞-in. round cold-drawn steel, located at the R. B. Phillips Co., Worcester, Mass., plant, and 914,778 lb. 1⅞-in. round cold-drawn steel, located at the Chapman Mfg. Co., Winchester, Mass., plant. It also offers for sale 1,500,000 lb. brass rods, 1 in. and under in diameter.

ESTABLISHED 1855

THE IRON AGE

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CHARLES S. BAUR, *Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *President and Treasurer* Fritz J. Frank, *Vice-President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Tremont Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building. Washington: 613 Fifteenth Street, N. W. San Francisco: 320 Market Street.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy, 50 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879

Costs and Market Prices

A well-known New York firm, which describes itself as a "wholesaler of general merchandise," has sent out widely the views of its president in correcting the report that this firm "looks for a general decline in prices in the near future and a speedy return to the pre-war level." One paragraph in the statement is this:

> Commodity prices in general are artificially high. They must come down. The sooner they come down the better for everyone. But nothing is gained by ignoring the plain fact that wholesale prices (and retail prices) depend on the cost of production. Until that comes down, talk about a lower level of prices is vain.

The cost of production is ordinarily an important factor in determining prices, but market prices do not "depend on the cost of production." They depend largely on how much of a given commodity is offered for sale and how many people are seeking to buy it; in other words, on the old-fashioned law of supply and demand. Many times in the history of the iron trade pig iron producers have said with confidence that their product could not decline because the prices at which ore and coke had been bought by the blast furnace companies made it impossible to reduce the pig iron price without going below cost. But in spite of all such arguments, pig iron prices have often declined below the cost line of some furnaces because more iron was being produced than the market would take.

So in the present readjustment of prices of various classes of merchandise generally described as "clothing," and including footwear, the original cost to the storekeeper is not a determining factor. It is probably the fact that the price reductions that have been widely advertised in the past few weeks have involved little or no cutting below cost, since wholesale and retail profits in these lines have been large and in many cases excessive. But if it is found that buying is not stimulated by the cuts already made, the cost line will not be the limit to the reductions that are ahead.

There has been some disposition to treat the price reductions in textile products and shoes as incidents, which do not necessarily point to a general market readjustment. Doubtless some industries will be slow to show any effect from the turn that has come in certain lines of retail trade, and it has already been pointed out in these columns that the situation in the steel industry is quite different from that in some merchandising lines. There should be no failure to distinguish between what may be called a surface readjustment such as that now under way and a fundamental readjustment such as affects wages, buying power, and the prices of basic products. But an entirely mistaken view of the situation is given in the statement quoted above that until cost of production comes down "talk about a lower level of prices is vain."

The idea that by refusing to buy at excessive prices they will bring prices down is taking firmer hold of the popular mind with every day. The peak has been passed in some commodity markets and in others the turning point is at hand. In real estate the frantic buying is over and the market is reacting. Economy is making a strong appeal to many consumers and the number of people willing to pay whatever price is asked is steadily lessening. It will yet be seen that a considerable lowering of market prices can be produced solely by this attitude of the buyer. The lowering of costs belongs to a later stage of the readjustment and involves much more than an effort to lighten overstocked store shelves.

Economies of Labor Saving

One aspect of the present economic and industrial situation has not been receiving the attention it deserves. In many quarters there is complaint that "progress," the term being used as substantially synonymous with construction work, is being discouraged or delayed by "high costs," and the high costs are attributed largely to high wage rates and poor performance on the part of labor.

Now, as a matter of fact, much of the work that is seen waiting to be done is in its essence work that is suggested by a desire to dispense with labor. In the aspect under consideration, it is obviously illogical to refrain, because labor is high priced, from doing something that will dispense with labor. It is when anything is high priced that

there is particular incentive to economize in its use. Obviously, it is undesirable to lock up high-priced labor in capital investment if the return year by year is to be made in the saving of labor of market value so constantly and rapidly diminishing that the investment will not amortize itself. But improvements usually promise quick and large returns, and a reasonably slow decline in the market value of labor can be taken care of. No one can question that a part of the increase in the cost of labor, measured by actual performance, that has occurred in the past five years is permanent. Part of the change has come by reason of immigration conditions and part has come by reason of a change of view as to how the different members of society should be rewarded for their individual efforts.

Much of the work that is calculated to save labor is work that needs to be done quickly. The high cost of labor is an incentive, not a deterrent. From this aspect, then, it is a case not of postponing such work but of hastening its completion. Every one says that there is much work to be done, because the war set us back several years in our progress; but there has been little disposition to analyze and classify the work. What is this work, if it is not largely work intended to economize? In respect to the production of many commodities the war caused us to build unusually fast rather than unusually slow.

In steel, we do not need more open-hearth furnaces so much as we need to install appliances whereby open-hearth furnaces can be operated with fewer men. In coal, we do not need to open more mines so much as we need facilities for utilizing coal more economically. We do not need more oil wells, established at great labor cost in drilling and producing the equipment, to drain still more rapidly our meager petroleum reserves, as much as we need more benzol and gas from by-product coking plants. We need hydro-electric plants, electrified railroads and many other things, all essentially calculated to save high-priced labor even though in their installation they require high-priced labor.

The test is whether the job contemplated will result eventually in the employment of less labor or of more labor. Much of the work in view falls in the former category and when it needs to be done at all it needs to be done as soon as possible. It is the other kind of work that may perhaps well be postponed to a more convenient season.

British steel export data for April, just issued and reviewed elsewhere in this issue, indicate a slight falling off. The April total was 274,337 gross tons against 295,716 tons for March and 262,676 tons as the average for the first quarter. In only one important product, tin plates, were shipments larger in April than in March, and in pig iron, rails, galvanized and black sheets and steel plates there was a decline of about 3000 tons in each. As compared with 1913, the recovery in British exports to May 1, 1920, is about as follows: Exports of pig iron are now 70 per cent of the monthly rate in 1913; of tin plate 65 per cent; of galvanized sheets, 54 per cent, and of steel rails only 18 per cent. In steel plates the present export rate is about 30 per cent larger than in 1913, and in black sheets it is about 2½ times greater. In the case of the United States the April iron and steel exports, of 395,120 tons, compare with an average of 353,300 tons per month in 1919 and an average for the first quarter of this year of 386,300 tons.

Curtailing Welfare Work

The news from Youngstown, Ohio, published in this issue of THE IRON AGE, to the effect that the scope of the industrial relations department of the Youngstown Sheet & Tube Co. has been much curtailed and some work wholly abandoned because the company feels that the men do not want this kind of service, furnishes an example of how difficult it is to help workingmen, especially when they include a large percentage of illiterates. While it is stated that the schools for foreign workers, the visits of nurses, and the legal aid department will be discontinued, it is significant that it is not announced that employee representation has been abandoned. The carrying on of company schools is always accompanied by much difficulty and workers for the improvement of foreigners have met with much discouragement along this line. It is also true that public night schools and other municipal functions are performing educational duties to an increasing extent in some communities, notably in Youngstown.

The action of the Youngstown company need not dishearten any one who is deeply interested in the well being of workingmen and it will not be at all surprising if even more radical changes in policy are announced by other companies. The path to better conditions is strewn with many obstacles, but no one can doubt that much has already been accomplished, and much more will be accomplished as students of men learn more accurately how they wish to be served and what methods are most efficient.

"Cheese" Versus Multiple Ingots

The use of individual or "cheese" ingots as the basis for certain rolled steel products is believed to be capable of important extension. Up to the present such ingots have been used only in the manufacture of wheels and locomotive tires. One American company has so employed them for some years with marked success and decided advantages over the multiple ingot are claimed. The details of this company's experience were published in THE IRON AGE May 27, 1920, and the principles of the process given.

At the spring meeting of the American Iron and Steel Institute, May 28, a new phase of this subject was presented which created considerable interest. It is the use of such small ingots for the manufacture of steel rails, as well as the rolling of cheese ingots directly into forging or other billets. Not only is a more uniform steel rail claimed to be possible but also a decided saving in cropped metal and mechanical manipulation of the large multiple ingot. The process as applied to rails and as presented to the institute by C. A. Witter was described in THE IRON AGE, June 3.

While it has been contended that the present steel rail, judging from the average percentage of

failures, is satisfactory, it is nevertheless in the common interest to have the best rail possible. If pipeless annular blooms made from individual ingots will insure a better rail at not too great an increase in cost over present rather cumbersome methods, the suggestion is worth careful study. But aside from this there is the greater yield of finished product from a given quantity of steel poured, a consideration of decided weight. The amount of discard in the cheese ingot is insignificant compared with that necessary with the multiple rail ingot poured small end up with no hot top. The present tendency toward economy in steel practice should favor the individual ingot or at least the multiple ingot with the large end up, combined with the hot top, for with the latter the discard is also small. In very few cases if any has the more modern type of multiple ingot been applied to rails. One possibly serious disadvantage in the use of cheese ingots as suggested is the large amount of space necessary to handle them where the output is heavy.

Aside from rail production, the application of the cheese ingot to forgings appears to have a bright future. The process is especially applicable to electric furnace practice and there are those who favor its introduction in this field.

Important Statistics

The Geological Survey has been requested by the Bituminous Coal Commission to ascertain the stocks of bituminous coal on hand and probable requirements for the next six months. The shortage of coal due to the switchmen's strike has made it imperative to undertake this investigation at the present time. It is, of course, admitted that spot prices are abnormally high and much anxiety has been expressed in some localities, particularly the Northwest, concerning the supply of coal for next winter. The Survey believes it is of the highest importance to obtain an approximation of the present stocks held by the larger industrial consumers, by the railroads, by representative public utilities, and by representative dealers. On account of the large amount of fuel used by the iron and steel industries a report is desired from every by-product coke plant and every steel plant, in order that the requirements of the industry may be accurately estimated. The blank that is being sent out is a very simple one and the information requested can be easily furnished. The Survey states that the value of the information will depend to a large extent upon the quickness with which it can be completed.

This undertaking is an important one and THE IRON AGE hopes that the co-operation on the part of iron and steel manufacturers will be prompt and complete. Certainly no one should complain about inefficiency in our departments in Washington unless he is willing to do his utmost in lending a helping hand to make the service more efficient. The recovery toward normal conditions following the switchmen's strike has been very slow and nothing should be left undone to accelerate that recovery.

Recent weeks have put the traffic manager in a place of maximum importance. In normal times he has played an important rôle in keeping up the steady flow of material to the wheels of manufacturing and of output from them, but never for so long a period as lately has he had to labor to clear away the obstacles to that steady flow. Interesting are the tales of the wholesale use of express company facilities, of the motor truck, of the telephone, of office forces on jobs needing herculean physical strength, of circuitous railroad routing over 500 miles because the more direct lines of 100 miles was impassable. What car shortage and railroad strikes have cost industry may never be known even approximately; but the worth of knowledge of transportation possibilities and of acquaintance with men in that field has been proved by many a factory which was forehanded enough to hold in its organization a highly capable traffic official.

CORRESPONDENCE

Standard Fineness Tests for Powdered Coal

To the Editor: An article by Mr. Shadgen in the Jan. 1 number of THE IRON AGE, entitled, "The Status of the Powdered Fuel Problem," has come to my attention. The author speaks of the desirability of settling on a uniform and standard method of making fineness tests on pulverized coal. I grant that, but I am forced to question most of his recommendations.

He suggests that 8-in. sieves should be used, nested and arranged in sequence, that a 100-gram sample always be used, and that the shaking time should not exceed one minute (a machine being preferable for use). It might be of interest in this connection to compare some of these recommendations with those made for the determination of the fineness of Portland cement by the Bureau of Standards and reported in its technologic paper No. 42, 1914, "Standardization of No. 200 Cement Sieves."

Assuming that it is best to use a 100-gram sample always (the Bureau recommends 50 grams for cement, and I see no reason why a larger sample should be used for coal), does Mr. Shadgen think it would be possible to get a value for fineness with a shaking period of not to exceed one minute? I have run a great many fineness tests on pulverized coal, and I have never been able to get a 10-gram sample (much less a 100-gram sample) much more than started through a 200-mesh sieve in one minute, even with the most violent shaking. I will grant that for screens coarser than 100-mesh, one minute will probably suffice for pulverized coal, but there ought to be very little residue on any screen coarser than that, and we are seldom interested in the fineness through anything but a 100-mesh and 200-mesh screens. For hand shaking, the bureau's recommendations require from 20 to 40 min. for a test, depending on conditions; for machine shaking, the time used by the testing laboratory of the Allis-Chalmers Mfg. Co., Milwaukee, is 30 min., while that used by the laboratories of the Universal Portland Cement Co. at Buffington, Ind., is 10 min. Further with regard to the use of the machine, the bureau admits that uniform results may be obtained on the same machine, but says that the results obtained by different machines may vary widely, and that in either case the results will probably differ from those obtained from hand sieving.

The author further disregards any effect that a difference in atmospheric conditions or a difference in the moisture content of the coal might have on the results. High relative atmospheric humidity and high moisture content of the coal both have a retarding action on the speed of sieving, so that a sample with ½ per cent moisture would give correct results in a length of sieving time that would be altogether too short for a sample with perhaps 3 per cent moisture, and the same sample sieved the same length of time on a dry day and a damp day would not give the same result.

As for the desirability of arranging the sieves in sequence, I do not think that anybody who was run-

ning a fineness test would be careless enough to put a 100-mesh sieve below a 200-mesh, for example.

Taking all these points into consideration, it seems to me that the only recommendation Mr. Shadgen has made that is worthy of any serious consideration is that 8-in. sieves should always be used. If the author doubts my statement that it is impossible by any sane method of shaking to get all the 200-mesh product from an ordinary sample of pulverized coal, 100 grams in one minute, I should suggest that he try it.

The Bureau of Standards has laid down in considerable detail the recommendations for a method of hand sieving that will give uniform results for determinations that are made down to 0.01 per cent fineness, and for routine work where an accuracy of 0.1 per cent or even 1 per cent is permissible, some modifications of the method may be permitted. Briefly, the method consists in taking a 50-gram sample, and sieving uniformly until not more than a small amount (0.05 gram for accurate work, and 0.1 gram or more where accuracy is not so essential) come through the sieve in a given length of time, usually 1 min. This method gives results that are sufficiently uniform for routine commercial work, and has the important advantage of eliminating the possibility of errors due to difference in atmospheric conditions, difference in moisture content, etc.—errors which may at first thought seem to be negligible, but which the Bureau of Standards has shown by very exhaustive study to be quite considerable.

W. J. RISLEY, JR.,
Decatur, Ill. Chemical Engineer.

"The Iron Age" and Its Readers

The demands on the editorial space of the present day business and technical journal are constantly increasing, more so, probably, than the average reader realizes. This is particularly true in the steel industry, where developments at home and abroad are of such great moment as affecting processes and markets. The tendency is exemplified in the columns of THE IRON AGE. In 1914 the average number of pages per issue was 58 to 60. Thus far in 1920, or for the first five months of the year, the average has been 72 pages per issue, or an increase of over 20 per cent.

Continued for a year this increase would amount to more than 600 pages of this journal. As one of our pages contains over four times as many words as the average page of the new books coming from the popular press month by month, it will be seen that IRON AGE readers now receive in a year 2400 more 12mo book pages than in the first year of the world war.

A gratifying response to this policy has come from the iron and steel and metal-working trades. In the four years and five months since Jan. 1, 1916, the list of paid subscribers to THE IRON AGE has increased by no less than 73.5 per cent.

By the fine co-operation of the blast furnace companies THE IRON AGE was able to receive by wire and compile on the first day of June the pig iron production figures for May, the compilation being completed less than 20 hr. after the last May iron had left the furnaces. It should be said in connection with this unusual statistical feat that readers of this paper were given the truth about pig iron output in May, namely, that there was an increase last month of nearly 5100 tons per day over the rate for April. Thus they were able to measure the recovery from the April slump when the outlaw railroad strike was at its worst.

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Lake Iron Ore Shipments in May

Iron ore shipments from the Lake Superior region in May were 5.45 per cent larger than in May, 1919. The total last month was 6,976,085 gross tons as contrasted with 6,615,341 tons in May, 1919. This is an increase of 360,744 tons for May, this year. The comparative shipments by ports for May, 1919 and 1920, and for the season were as follows in gross tons:

	May, 1919	May, 1920	To June 1, 1919	To June 1, 1920
Escanaba	583,463	795,673	654,880	795,673
Marquette	151,749	375,036	151,749	375,036
Ashland	669,647	1,013,049	817,005	1,013,049
Superior	1,250,536	1,983,660	1,352,267	2,189,246
Duluth	2,957,338	1,662,971	3,751,387	1,688,239
Two Harbors	1,002,608	1,145,696	1,300,292	1,145,696
Total	6,615,341	6,976,085	8,027,580	7,206,939
Increase	.....	360,744	.....	.....
Decrease	.....	.....	.....	820,641

The decrease to June 1, this year, is 10.22 per cent as compared with the same date in 1919, or 820,641 tons. The Duluth and Superior percentage of the total to June 1, this year, was 53.80 per cent against 63.57 per cent last year. In 1917 this was only 48.81 per cent of the total. The Escanaba proportion was 11.04 per cent of the total as compared with 8.16 per cent last year. Duluth showed a decrease of about 50 per cent from last year, but Two Harbors 15.90 per cent as compared with 16.20 per cent.

Contract for Merchant Steel Mill

The Interstate Iron & Steel Co., 104 South Michigan Avenue, Chicago, has awarded a contract to the Great Lakes Dredge & Dock Co. for the construction of a merchant steel mill, 100 x 900 ft., 118th Street and Calumet River, to cost $312,400.

TARIFF BILLS NOT PASSED

Congress Adjourns Until December Leaving Many Measures Not Acted Upon

WASHINGTON, June 8.—Congress took final adjournment on Saturday and for the first time since 1915 its members will be able to spend the summer at home. With the exception of the summers of 1911 and 1915, Congress has hammered away almost continuously the year round for the past decade. Unless the President calls a special session in the fall, which, it has been officially stated, is not probable, Congress will not return again until the regular session in December.

The appropriations made for the coming fiscal year totaled about $4,125,000,000. This included permanent appropriations of $1,492,000,000 for the public debt, sinking funds for public roads, and Government departments and industries not provided for in the thirteen regular annual supply measures.

Numerous measures which were the subject of discussion failed of enactment. Among these was the soldiers' bonus bill which was passed by the House but allowed to slumber in the Senate without even consideration in committee. None of the tariff bills passed by the House obtained any consideration in the Senate. Among these were the tungsten, magnesite and chemical glassware bills designed to protect industries built up during the war; the dye embargo bill, also a war industry measure; the zinc, and pearl button bills; and the anti-dumping bill. The Senate majority leaders preferred to delay tariff legislation until the general revision of the tariff laws next winter, and accordingly made but little effort to push the bills passed by the House.

The merchant marine bill was one of the chief measures of the session. The conference report on the bill was put through both houses during the final days of the session, after a stiff fight. The bill increases the membership of the shipping board from five to seven members and raises the salaries from $7,500 to $12,000. It directs the shipping board to sell the Government vessels as soon as practicable, consistent with good judgment, but does not restrict the sales price to the cost of reproduction less depreciation, as was the case in the Senate bill.

The bill provides that the shipping board may sell any vessels to foreign interests if it has failed to dispose of them to Americans after diligent efforts and the sale is approved by five of the seven members. A restriction limiting the sale of foreign interests of vessels under 6,000 tons was stricken out of the bill in conference. Another change in the Senate bill made by the conference committee was the elimination of the rquirement that coastwise vessels must be 100 per cent American owned, and ships in foreign trade 75 per cent American owned. The bill as it now stands provides that coastwise lines must be 75 per cent American and lines in foreign trade must be controlled by Americans.

One of the measures passed by Congress during the final week was a resolution which in effect repeals all war legislation except the food control, and trading with the enemy acts, and the Liberty bond and Victory loan acts.

One of the unexpected events of the final day of the session was the failure of budget legislation. The Senate defeated the bill in a filibuster after the House had repassed the measure with an amendment, following a veto by President Wilson. O. F. S.

Coke Plant Work at Johnstown

The Cambria Steel Co. has authorized extensive improvements at its Johnstown, Pa., plant, as noted in these columns on May 27. The Semet-Solvay Co. will construct a by-product plant for the recovery of ammonium sulphate, tar and light oil from the 11 blocks, totaling 492 coke ovens, at the Franklin works, a plant for the rectification of the light oil to motor benzol, with a capacity to handle all the light oil produced from both the Franklin plant and the Rosedale plant, two blocks of Semet-Solvay ovens of 44 ovens each, at the Rosedale plant, and an additional block of ovens of the Cambria type from material already on hand, making, when completed, a plant of 208 ovens. The Semet-Solvay Co. will also install a coal washery plant, coal breaker, boiler plant, coal and coke handling machinery. When the work is completed, the Cambria Steel Co. will have a capacity for coking about 9000 net tons of coal per day at the two plants.

Transportation Act Amended

WASHINGTON, June 8.—Two amendments to the transportation act designed to aid the railroads in financing their equipment needs were included in the sundry civil appropriation bill as passed by Congress.

Section 210 of the law was amended so that carriers which obtained loans from the $300,000,000 revolving fund will have 15 years to pay instead of five years. The Interstate Commerce Commission is given sole authority over the security to be required from the carriers.

Another important change in section 210 is the addition of a paragraph providing for the creation of a car equipment trust corporation, if the commission deems it necessary, to handle the financing of the purchasing of cars by the carriers. This action of Congress places official approval on the plan of the commission to set aside $125,000,000 out of the $300,000,000 fund to be advanced to carriers for the application on car orders, the program being to handle this through the corporation. In appearing before the commission urging the creation of such a corporation, S. Davies Warfield, president of the National Association of the Owners of Railroad Securities, said that no voluntary association could have the force of a national organization with full powers approved by Congress.

Slight Improvement in the Coke Region

UNIONTOWN, Pa., June 7.—Car shortage is again manifest in the Connellsville coal and coke region, although placements for the past week have been better than for some weeks. The lack of adequate rolling stock, however, has served to restrict output during the week with an insistent demand for fuel.

Despite the demand and high market conservative operators believe that the peak in the market, with coke at $15, ovens, and coal at $8, mines, has been reached. Blast furnace interests during the week took a hand in the market situation, consistently refusing to pay above $12, ovens, for coke. So far no contracts for third quarter or last half have been reported.

Car placements for the week averaged about 55 per cent for coke and around 25 per cent for coal.

Shipbuilding Plants for Sale

DETROIT, June 7.—Bids on the plants of the Great Lakes Engineering Works at Detroit, Ecorse and Ashtabula, Ohio, are being solicited by the board of directors of the company, it having been decided that the best way to conserve the interests of the stockholders was to sell out. The company, which has built some of the largest and most modern freight vessels on the Great Lakes, was incorporated in Michigan in 1902 and opened its plant in Ashtabula in 1910. Since the outbreak of the war, its activities have been centered mainly on the construction of ocean-going steamships for the Government. There is $2,500,000 stock outstanding.

Will Extend By-products Plant

The By-Products Coke Corporation, 322 South Michigan Avenue, Chicago, has purchased a tract, 595 x 2160 ft., at the northwest corner of 110th Street and Burley Avenue, adjoining its present plant, and also 250 x 595 ft. at the southwest corner of 110th Street and Corondolet Avenue. The property will be used for extensions, but definite plans have not yet been formulated.

British Steel Exports and Imports in April

British steel exports in April this year, excluding iron ore and including scrap, were 274,337 gross tons which compare with 295,716 tons in March and 261,248 tons in January. The April figures exceed the outgo for any month in 1917, 1918 or 1919 and compare with an average of 262,676 tons per month for the first quarter of this year. The April exports in 1919 were 174,219 tons. The present rate, however, is far below that of 1913.

Iron and steel imports in April this year were 71,161 as against 72,491 tons in March, 71,997 tons in February, and 79,024 tons in January. The April imports of 71,161 compare with an average of 75,504 tons per month for the quarter. The April imports were exceeded only three times in 1919, when they were 87,892 tons in October, 76,163 tons in September and 73,516 tons in November. In April, 1919, the imports were only 14,598 tons.

The following summary gives the relative exports and imports of January, February, March and April, 1919 and 1920, and the average per month for 1913 and 1919 in gross tons:

	Exports	Imports
Average first quarter, 1919	147,228	44,713
April, 1919	174,219	14,598
Average first quarter, 1920	262,676	74,504
April, 1920	274,337	71,161

The trend of some of the principal exports is shown by the following data in gross tons:

	Av. Per Month, 1913.	Av. Per Month, 1919.	April, 1919.	April, 1920.
Pig iron	78,771	21,503	15,450	52,095
Steel rails	41,676	10,435	7,071	7,408
Steel plates	11,162	19,996	19,876	12,393
Steel bars	20,921	20,787	18,762	27,825
Galvanized sheets	63,506	15,508	13,244	36,206
Tin plates	41,208	24,147	25,195	32,951
Black sheets	5,679	11,109	12,406	13,160

The principal export gains in April, 1920, over April, 1919, and the 1919 monthly average have been in pig iron, steel bars, galvanized sheets and tin plates.

Pig-iron imports last April were 11,216 tons against 17,620 in March, 15,500 in February, 1920, and 2533 tons in April, 1919. The average per month in 1919 was 13,623 tons and in 1913 they were 18,059 tons per month.

Iron ore imports in April this year were 736,710 tons, bringing the total to April to 2,044,685 tons as compared with 1,747,935 tons to May 1, 1919.

Manganese ore imports in May, 1920, were 25,120 tons. These compared with 36,300 tons in April, 1919, and with 50,098 tons per month in all of 1913. The total for the first four months of this year has been 109,482 tons against 131,754 tons to May 1, 1919. The average per month in 1919 was 22,150 tons.

Reduced Imports in China

WASHINGTON, June 8.—Consul General George E. Anderson reports from Hongkong that the uncertainty of the future in any line and especially the uncertain political conditions in South China, and the high cost of materials and machinery itself, as well as lack of free capital, all combined to reduce the imports of machinery into Hongkong in 1919 to a minimum.

"The total imports of the year are placed at $2,555,678, and compare with a value of $3,169,238 in 1918, which in itself was a poor year," says Mr. Anderson. "The greatest decrease was in imports of internal combustion engines and marks a slowing up of the demand for marine motors and the construction of motor boats for use on the rivers of South China, but there were also sharp declines in imports of electrical machinery and boilers. Of the imports of internal combustion engines in 1919 the United States furnished 73 per cent and Great Britain directly or indirectly the rest. The United States also furnished 80 per cent of the steam engines imported and Great Britain the rest."

The Alloy Electric Steel Co., Warren, Ohio, has acquired a site west of Leavittsburg, Trumbull County, Ohio, where its plant will be erected. The contract for the initial unit, 110 x 280 ft., has been awarded.

Business Paper Editors Meet

The national association of editors of trade and technical publications, known as the National Conference of Business Paper Editors, held a three-session meeting at the Congress Hotel, Chicago, June 4. Besides a large number from Chicago, editors were present from New York, Des Moines, Cleveland, St. Louis, Milwaukee, Grand Rapids, Detroit, Toronto, Boston, Indianapolis, Battle Creek, Louisville, Kansas City and Springfield, Ohio. About 105 registered and the meeting would have been even larger except for an important engineering meeting in Washington at the same time.

Such topics as "Improving the Appearance of Our Editorial Pages," "Where To Get Editors," and the expansion of lists of contributors were discussed, and part of the afternoon was given over to a presentation by a number of editors of the facts in various fields and to comment on the business outlook. One of the speeches at the dinner, made by E. C. Hole, *American Lumberman*, Chicago, had to do with the breakdown in postal service. He urged that business houses keep a record of the time that it has taken letters to reach them, so that these records may be sent to congressmen to get them fully appreciative of the need of prompt improvement. He devoted himself only to the first class service delays, which have caused all forms of business, including publishing, an increased amount of traveling and an increased use of the telegraph and telephone to an extent that is far greater than the economies attempted by the Post Office Department. Mr. Hole has secured the active support of the Chicago Association of Commerce, which has printed for its members large quantities of a series of little inserts to be used with letters to get the active co-operation of business houses all over the country.

A. I. Findley, editor THE IRON AGE, is president of the National Conference, and R. Dawson Hall, editor *Coal Age*, New York, is secretary.

How Surplus Supplies in Europe Were Disposed of.

WASHINGTON, June 8.—A final report of the United States liquidation commission, which disposed of the War Department's surplus supplies which were in Europe and settled the claims and accounts with the allied governments, shows that supplies and equipment of an estimated value of $672,000,000 were returned to the United States while the remainder was sold in Europe for $822,923,225.82.

Sales of approximately $108,700,00 were made for cash on delivery; sales of approximately $532,500,000 were made to the French Government; sales amounting to about $29,000,000 were made to Belgium; and sales aggregating $140,100,000 were made to Poland, Czecho-Slovakia, Serbia, Roumania and other so-called liberated nations of Central Europe and the Near East. Those made to the nations mentioned are evidenced by their 5 per cent interest bearing bonds maturing from two to 10 years after date. Other sales were made on short term credits, which have been or are being collected by the appropriate army services.

The most important sale consummated was what is known as the "bulk sale" to France of surplus war stocks remaining unsold in France on Aug. 1, 1919; the considerations moving from France being (a) $400,000,000 in 10-year 5 per cent bonds; (b) the assumption by France of all rents for installations accruing after Aug. 1, 1919; and the agreement of France to hold America harmless against all claims (numbering approximately 150,000) of every nature whaatsoever arising out of American occupation and use of such installations and lands; and (c) the waiver by France of all claims whatsoever (conservatively estimated at $150,000,000) for taxes or customs on properties imported into France and sold since April 6, 1917.

The Straus trunnion bascule bridge has been adopted by Norfolk County, Ontario, for a highway bridge to be built across the head of the harbor at Port Dover, Ontario.

Iron and Steel Markets

IMPROVEMENT IS SLOW

Railroad Situation Still the Limiting Factor

Little New Buying—Easier Conditions Continue in Plates and Structural Shapes

Producers and industrial consumers of steel are still so involved in delivery troubles that new buying and developments affecting prices are entirely secondary. In some published statements the week's railroad movement of iron and steel has been put too favorably. Chicago has made practically no gain, and concerning Pittsburgh conditions, reports are conflicting. However, the strike is wearing out, and in some districts more rapid improvement is promised for the coming fortnight.

The view is quite general in the trade that the steel market is unaffected by the recent reductions in some merchandising lines, yet the marked drop in inquiry has raised some new questions. The different products are differently affected. To secure several thousand tons of shapes, 3.15c., Pittsburgh, was named by a mill that has adhered to 4c., and 1000 tons of plates were sold at less than 3.50c. But in steel bars the excess of demand over supply leaves them the conspicuously strong feature they have been for months. At the same time a Western independent producer continues to sell bars to its customers at 3c., Pittsburgh.

Plates and structural shapes are chiefly talked of in connection with any easing from the rigid price stand of early April. But on export plates there has been no yielding. Some further plate business has been placed here by English and Scotch shipyards, and one large export company's May bookings in various finished products were the largest month's total this year.

The fuel situation still hampers some pig iron and steel producers seriously. Foundries in all parts of the country are crippled for lack of coke, and in turn lack of castings is cutting down operations of machine shops and automobile factories.

The decrease in automobile production is due in part, however, to a slump in demand for all but the cheaper cars. Men laid off by automobile makers at Detroit have appeared in the Chicago district seeking work at steel plants. These are indications that in certain Central Western districts some of the unemployment recently reported is due to a slowing of business apart from that caused by the railroad strike.

No more is heard of the feverish efforts of buyers to secure wire nails without regard to price. But quite an active export demand has sprung up. Central Western makers have been quoting wire nails for export at $5.75 to $6, and galvanized barb wire at $6.25 at mill.

In the dearth of new orders the placing of 15,000 tons of plates, shapes and bars by the Pennsylvania Railroad stands out, all going to the Steel Corporation.

South America has bought 7000 tons of standard rails, which can be rolled on a light rail mill. Export business in light rails continues in fair volume.

Insistent requests for third quarter and last half contracts on bolts and nuts show no let-up. Some makers have advanced their prices again by 10 per cent on machine and carriage bolts and lag screws. Two Central Western interests are now entering orders for nuts, bolts and rivets at recent prices, for delivery over the last half of the year.

Inquiry for pig iron for export, including both foundry and steel making grades, is active and it would be possible to export considerable if the iron could be obtained, but furnaces at the present low production are slow to take foreign business. The pig iron market is extremely quiet in Chicago, with a tendency by sellers to make concessions, but for the most part prices throughout the country are being maintained. Fewer sales of Alabama iron are being made above $42, furnace. The basic pig iron market at Pittsburgh is fairly active and higher prices seem probable. The foundry situation is easier at Cleveland on account of the improvement in the railroad movement.

The Lake ore moved to June 1, while 1,800,000 tons under what it should have been with an earlier spring and no curtailment by strikes, shows that May was not much over 10 per cent off from May, 1919, and the season's shipments may suffice for the restricted furnace activity caused by the continuing car shortage. A pooling of boats for shipping coal to upper Lake ports has been authorized, but the ore shippers are not a unit in asking for a similar action in pro-rating ore.

England is still harassed by labor disturbances, 30,000 steel workers striking at Sheffield. Prices are easier in tin plate, but at that $14.20 is obtained per base box, against $8.50 and $9 in this country. No higher prices have been named on pig iron, but allocation to Scotland has been cut down to 50 per cent.

Pittsburgh

PITTSBURGH, June 8.

Reports regarding the local railroad situation are conflicting. Some local shippers report they are receiving more cars and the railroads are moving them more promptly than at any time since the strike started. Others state there has been very little increase in the number of empties they are receiving and that the railroads are handling these in a very slow manner. Local officials of the Pennsylvania and the Pittsburgh & Lake Erie claim both railroads are operating now at 65 to 70 per cent of normal. The Pennsylvania Railroad is handling 52,000 to 53,000 cars per day between Altoona, Pa., and Crestline, Ohio, against a normal movement of about 65,000 cars. Officials of the Baltimore & Ohio say that road is operating at 100 per cent, but there are still serious delays in ship-

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 8, 1920	June 1, 1920	May 11, 1920	June 10, 1919
No. 2 X, Philadelphia‡	$47.15	$47.15	$47.05	$29.50
No. 2, Valley furnace†	45.00	45.00	44.00	26.75
No. 2, Southern, Cin'ti†	45.60	45.60	45.60	28.35
No. 2, Birmingham, Ala.†	42.00	42.00	42.00	24.75
No. 2, furnace, Chicago*	43.00	43.00	43.00	26.75
Basic, del'd, East. Pa.	44.80	44.80	44.80	25.50
Basic, Valley furnace	43.50	43.50	43.00	25.75
Bessemer, Pittsburgh	44.40	44.40	43.90	29.35
Malleable, Chicago*	43.50	43.50	43.50	27.25
Malleable, Valley	44.00	44.00	44.00	27.25
Gray forge, Pittsburgh	43.40	43.40	43.40	27.15
L. S. charcoal, Chicago	57.50	57.50	57.50	38.85
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy at mill	$55.00	$55.00	$55.00	$45.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	47.00
Bess. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. billets, Pittsburgh	60.00	60.00	60.00	38.50
O.-h. sheet bars, P'gh.	80.00	80.00	80.00	42.00
Forging billets, base, P'gh.	**85.00**	80.00	80.00	51.00
O.-h. billets, Philadelphia	64.10	64.10	64.10	42.50
Wire rods, Pittsburgh	75.00	75.00	70.00	52.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	4.25	4.25	4.25	2.595
Iron bars, Pittsburgh	4.25	4.25	4.25	2.35
Iron bars, Chicago	3.75	3.75	3.75	2.50
Steel bars, Pittsburgh	3.50	3.50	3.75	2.35
Steel bars, New York	4.02	4.02	4.02	2.62
Tank plates, Pittsburgh	*3.50*	3.75	3.75	2.65
Tank plates, New York	*3.77*	4.02	4.02	2.92
Beams, etc., Pittsburgh	3.10	3.10	3.10	2.45
Beams, etc., New York	3.27	3.27	3.27	2.72
Skelp, grooved steel, P'gh.	2.75	2.75	2.75	2.45
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	2.65
Steel hoops, Pittsburgh	5.00	5.00	5.00	3.05

*The average switching charge for delivery to foundries in the Chicago district is 50c per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	June 8, 1920 Cents	June 1, 1920 Cents	May 11, 1920 Cents	June 10, 1919 Cents
Sheets, black, No. 28, P'gh.	5.50	5.50	5.50	4.35
Sheets, galv., No. 28, P'gh.	7.00	7.00	7.00	5.70
Sheets, blue, an'l'd, 9 & 10.	4.50	4.50	4.50	...
Wire nails, Pittsburgh	4.00	4.00	4.00	3.25
Plain wire, Pittsburgh	3.50	3.50	3.50	3.00
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.10
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$35.50*	$36.00	$37.00	$20.50
Carwheels, Philadelphia	38.00	38.00	40.00	22.00
Heavy steel scrap, P'gh.	25.00	25.00	25.00	17.50
Heavy steel scrap, Phila.	22.50	22.50	23.50	16.00
Heavy steel scrap, Ch'go	*22.00*	22.50	23.00	16.00
No. 1 cast, Pittsburgh	32.00	32.00	32.00	19.00
No. 1 cast, Philadelphia	37.00	37.00	38.00	22.00
No. 1 cast, Ch'go (net ton)	*35.50*	36.50	37.50	19.50
No. 1 RR. wrot, Phila.	33.00	33.00	34.00	21.00
No. 1 RR. wrot, Ch'go (net)	*25.00*	25.50	26.50	16.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$14.00	$14.00	$11.00	$4.00
Furnace coke, future	14.00	14.00	11.00	4.00
Foundry coke, prompt	15.00	15.00	12.00	4.50
Foundry coke, future	15.00	15.00	12.00	5.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	19.00	19.00	19.00	17.75
Electrolytic copper, N. Y.	19.00	19.00	19.00	17.50
Zinc, St. Louis	**7.75**	7.70	7.80	6.30
Zinc, New York	**8.10**	8.05	8.15	6.65
Lead, St. Louis	**8.50**	8.15	8.15	5.00
Lead, New York	**8.75**	8.50	8.50	5.25
Tin, New York	*49.25*	51.50	56.25	72.50
Antimony (Asiatic), N.Y.	*8.75*	9.00	10.00	8.37½

The above prices are for domestic delivery and do not necessarily apply to export business.

ments on this road. The main trouble now is and has been for some time the very serious shortage in supply of open and closed cars. Promises of railroad officials that empties would be hurried back to the Pittsburgh district for loading have been only partly carried out. Large shippers report that on some days they get a fair quota of cars spotted for them, and then for two or three days they get very few.

There is no doubt that the railroad strike which is now going on three months' duration is slowly wearing itself out. Many of the former employees have returned to work, and others are doing so every day, but the main increases in working forces on the local railroads have come from new men, who have to be shown how to do the work, and do it much more slowly than experienced men. It is only a matter of time until the railroads get back to normal, but the process is going to be slow. In the coke regions the shortage of cars in the past few days has been more serious than at any time for several months. Two large producers of coke report that on Monday and Tuesday this week they did not get any cars from the Monongahela River Railroad, this being a line that serves the two Connellsville coke regions, and is owned and operated jointly by the Pennsylvania and Pittsburgh & Lake Erie. A few companies report that their stocks of iron and steel products, piled in warehouses, mill yards and on cars, are slowly decreasing, while others report stocks are a little heavier than a week ago. The Carnegie Steel Co. alone is said to have close to 250,000 tons of finished steel of various kinds, in stock and loaded on cars, ready to be moved to customers. On Monday the American Sheet & Tinplate Co. had about 61,500 tons of sheet and tin mill products piled in its various warehouses and loaded on cars, a slight increase over the figures of last week.

A fair amount of new business is being done in pig iron, semi-finished steel and finished steel, but both consumers and producers are showing a strong tendency to be slow in the matter of making new obligations. So much material is due consumers, and being delivered very slowly that they have come to feel there is no advantage in placing further contracts until they have received some of this material due them. Prices all along the line are fairly strong, and on basic iron are likely to be higher, due to quite an active demand that has come up recently from domestic consumers, and also for export shipment. However, the opinion is general that the peak on most iron and steel prices has been reached, and that the tendency is toward lower values, which may come as soon as the freight congestion has been cleared up to some extent.

Pig Iron.—A feature of the local pig iron market is the active inquiry for Bessemer and basic iron for export. A local interest has sold 1500 tons of standard Bessemer iron for export at $45, Valley furnace, and this price is being quoted by several other local furnaces and also by dealers who have inquiries for Bessemer for export. There is also an inquiry in the market for 3000 tons and another for 1500 tons of basic for export. The domestic inquiry for Bessemer and basic iron is more active than for some time, and a fair amount of iron is being sold, nearly all for prompt shipment. A local interest reports sales in the last few days of 10,000 to 11,000 tons of basic iron for prompt delivery, all at $43.50, Valley furnace. This

interest states it will not take any more business in basic iron at that price, but will quote higher on any further inquiries. The Whitaker-Glessner Co., which has had an inquiry in this market for about a week for 10,000 tons of basic iron for its Portsmouth, Ohio, open-hearth steel plant, has not yet closed. Moderate lots of foundry iron are being sold for prompt delivery at about $45, Valley furnace, for No. 2 iron, the inquiry coming mostly from consumers who are not getting deliveries on old contracts. Furnaces report delivery of coke as only fairly satisfactory, and say they are still unable to get any stock ahead. Cars are loaded with coke and are started in fairly good shape, and then are tied up somewhere along the line for days before they reach destination. However, output of pig iron in the Pittsburgh district is very close to normal, but in the Youngstown, Wheeling and New Castle districts is much below what it should be. Prices are firm and a higher market on basic iron in the near future is likely.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being $1.40 per gross ton:

Basic	$43.50
Bessemer	43.00
Gray forge	42.00
No. 2 foundry	45.00
No. 3 foundry	43.50
Malleable	44.00

Billets and Sheet Bars.—We note a sale of 5000 tons of open-hearth sheet bars by a local interest to a dealer, these bars to be rolled by a leading company into sheets for a prominent automobile maker. The price is said to have been about $85 at maker's mill. Output of ingots in the Pittsburgh district is now running close to 80 per cent of normal, the largest output at any time since the railroad strike started. Youngstown, New Castle and Wheeling steel mills are not doing so well, and are probably not turning out more than 50 per cent of normal production. There is not much inquiry for either billets or sheet bars, and shipments by the local interest to sheet and tin plate mills are getting better. There is some export inquiry, but owing to the railroad situation local steel interests are not quoting.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $38 to $60; 2 x 2-in. billets, $42; Bessemer sheet bars, $42 to $65; open-hearth sheet bars, $42 to $75, and forging billets, ordinary carbons, $85 to $90 base, all f.o.b. Youngstown or Pittsburgh mill.

Ferroalloys.—Sales of a carload up to two or three carloads of domestic ferromanganese are being made for prompt delivery at $240 to $250 delivered. There is no inquiry for last half delivery, as consumers are pretty well covered. A sale of 100 tons of 50 per cent ferrosilicon is reported at about $80 delivered.

We quote 76 to 80 per cent domestic ferromanganese $200 for last half delivery and $250 for prompt delivery, with a reduction of $1.50 to $1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at $80 to $85 and 18 to 22 per cent spiegeleisen at $70 to $75, furnace. Prices on Bessemer ferrosilicon are: 9 per cent, $56.50; 10 per cent, $59.50; 11 per cent, $62.50; 12 per cent, $66.10. We quote 6 per cent silvery iron, $48.25 to $48.75; 7 per cent, $52.50 to $53; 8 per cent, $54.50 to $55; 9 per cent, $56.50 to $57, and 10 per cent, $59 to $59.50. An advance of $3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of $2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Structural Material.—Local fabricators say that inquiry in the past week or two has been very light, largely due to the railroad situation, which makes deliveries very slow. Shipments by the mills are almost as bad as at any time since the strike started, and some plain material is being hauled by trucks from local mill to nearby points, where it is to be used. The Carnegie Steel Co. price on beams and channels up to 15 in. is 2.45c. and the other local maker is quoting 2.90c. to 3.25c., its prices depending on the customer, the quantity and the delivery wanted. The Cambria Steel Co. is still quoting 4c. Pittsburg on plain material.

Plates.—Local car builders report the situation is very quiet. Inquiries for cars are light, and railroads do not seem to be able to make the necessary financial terms to enable them to buy cars and other track material. There has been a considerable slackening in the demand for plates, and some smaller mills are going after orders more urgently than for some time. It is said two or three mills are in position to take orders for plates and make delivery in 30 to 60 days. The Carnegie Steel Co. price on sheared plates remains at 2.65c. for such delivery as it can make, while independent mills are quoting ¼ in. and heavier plates at 3c. to 3.50c., at mill, the price quoted depending largely on the customer and the delivery wanted.

We quote sheared plates of tank quality, ¼-in. and heavier, at 2.65c. to 3c. for very indefinite delivery, while prices on ¼-in. and heavier plates, named by mills that will agree to ship out in three to four months, is 3.50c.

Sheets.—This week the American Sheet & Tin Plate Co. is operating to about 83 per cent of hot sheet mill capacity. Operations of the independent mills are better and are averaging close to 75 per cent. The heavy premiums in prices quoted for some months on sheets by some independent mills are fast disappearing, and the wide gap in prices on sheets of the leading interest and some independent mills is being narrowed considerably. Sheet mills in Youngstown and Niles, Ohio, districts are now operating better than at any time since the railroad strike started. The demand for automobile and electric sheet is still active, but is not so heavy as some time ago.

We quote No. 28 gage box annealed one-pass black sheets at 4.35c. to 6.50c.; No. 28 galvanized, 5.70c. to 8.50c., and Nos. 9 and 10 blue annealed at 3.55c. to 6c., the lower prices named being the March 21 schedules, which are still named by the leading interests, while the higher prices represent a fair range of quotations by the independent mills.

Tin Plate.—Operations of the American Sheet & Tin Plate Co. this week are on a slightly larger scale than last week. The Pittsburgh and Lake Erie is giving better service to tin plate mills at Monessen, McKeesport and Woodlawn, Pa. The preference order recently issued by the car service section of the American Railway Association was originally scheduled to be in force two weeks, June 1 to June 14, both dates inclusive. However, the tin plate and tin can manufacturers desire to have the time limit of the order extended, and for this purpose a conference was held in Washington between the tin plate and tin can makers, the traffic managers of the steel companies and the car service section, and it is believed the order will be extended for 10 days or two weeks more. This order provides that so many cars per day were to be allotted to the tin plate mills, depending upon their capacity, but it is said to have worked out in only a fairly satisfactory way. Strong efforts will be made to get an increase in the allotment of cars for tin plate and tin can shipments. On Monday, the American Sheet & Tin Plate Co. had no less than 61,500 tons of finished sheet and tin mill products piled in its warehouses and loaded on cars, ready to go to consumers. The Jones & Laughlin Steel Co. recently had 300,000 boxes of tin plate stored, but this quantity has been reduced somewhat. Export inquiry has fallen off a good deal, especially from Japan owing to the financial troubles in that country. An inquiry is in this market for 200,000 base boxes of tin plate for shipment to South America. The domestic demand is fair. Most consumers are covered on their needs for this year, but report deliveries are far from satisfactory.

We now quote tin plate to domestic consumers for remainder of the year delivery at $7 to $8.50 base box, stock items $9, and for export $11 to $12 per base box, all f.o.b. Pittsburgh.

Steel Rails.—Most of the new business being placed in light rails is going to the re-rolling mills, as the mills that roll light rails from billets are practically sold up for the remainder of this year. Very little is being done in standard sections, and there are no large inquiries in the market.

The Carnegie Steel Co. is still quoting the March 21, 1919, prices, these being 2.45c. for 25 to 45-lb. sections, 2.49½c. for 16-lb. and 20-lb. sections, 2.54c. for 12-lb. and 14-lb. sections, and 2.58½c. for 8-lb. and 10-lb. sections. This company is also quoting standard sections 50 lb. and heavier at $45 for Bessemer and $47 for open hearth stock. The Cambria Steel Co. is quoting 25-lb. to 45-lb. sections at 3.75c., 16-lb. and 20-lb. sections, 3.79½c., and 12-lb., 3.84c. at mill, for such delivery as it can make.

Wire Rods.—A local interest reports it has sold considerable tonnage of wire rods for third quarter delivery, and now has all the obligations on its books it cares to take. The demand for wire rods is active, but the available supply is very limited. We quote soft Bessemer and open-hearth rods at $75, screw stock rods $80 to $85, and high carbon rods $85 to $100, prices on the latter depending on the carbon content.

Wire Products.—There is an active export demand for wire and wire nails, and two local makers that always reserve a fixed part of their output for export are quoting wire nails at $5.75 to $6 base, galvanized wire 5.50c. to 5.75c. and galvanized barbed wire 6.25c. at mill for export. The domestic demand for wire and wire nails is fairly active, but the dull season in wire products is now in sight, and only a fair amount of business is being placed. However, the mills making wire and wire nails are well sold up over third quarter. Local mills continue to sell wire nails in a limited way to regular customers at $4 base and plain manufacturing wire for such delivery as they can make. Prices on wire products are given in detail on page 1697.

We quote wire nails at $3.25 base, this being the price of the American Steel & Wire Co., and $4 base on the new card recently issued by four or five of the independent mills. We quote bright basic wire at $3, this being the price of the American Steel & Wire Co., and $3.50, this being the price of most of the independent mills.

Iron and Steel Bars.—The demand for both iron and steel bars is not so urgent as some time ago, and all consumers have very large tonnages still due them on old contracts on which deliveries are very slow, owing to the railroad situation. The demand for steel bars for prompt shipment is very dull, and independent steel bar mills are now quoting 3c. to 3.25c. to regular customers for such delivery as they can make. One independent mill is still quoting steel bars at 4c. base and states it is making sales right along at that price. Common iron bars are in fair demand and are held at 4.25c. to 4.50c. at mill. Reinforcing steel bars are much duller in demand, owing to the great falling off in building operations all over the country.

We quote steel bars rolled from billets at 2.35c., this being the price of the Carnegie Steel Co. for very indefinite delivery, likely not before first quarter of next year. Other mills rolling steel bars from billets quote from 3c. to 3.50c. at mill, prices depending entirely on the buyer and the delivery wanted. The demand for concrete reinforcing steel bars is fairly active, and we quote these, when rolled from billets, at 4c. to 4.25c., and from old steel rails at about 3.50c. at mill. We quote common iron bars at 4.25c. to 4.50c. and refined iron bars at 4.50c. to 5c, in carloads, f.o.b. mill, Pittsburgh.

Cotton Ties.—The Carnegie Steel Co. has announced its price on cotton ties for this season as $2 per bundle of 45 lb., f.o.b. at mill, an increase of 30c. per bundle over its price of last year. This price is good for June, the carrying charge being 1½c. per bundle per month, the same as last year. The Pittsburgh Steel Co., the only other maker of cotton ties in this district, has not yet announced its price, and will not do so until it starts to roll. The Sharon Steel Hoop Co., Sharon, Pa., did not make any cotton ties last year, and it is understood will not make any this year.

Nuts, Bolts and Rivets.—Two leading local makers of nuts, bolts and rivets are now entering orders for these products at present prices for delivery over the last half of this year. The demand for nuts and bolts has fallen off a good deal lately, but local makers say they are not worried about this, as they are well sold up for two or three months. Discounts on nuts and bolts are given in detail on page 1697, these being the prices at which probably 90 per cent of the nut and bolt business is being done.

Spikes.—The Norfolk & Western Railroad, which came in the market recently for 6200 kegs of railroad spikes, announces it will not buy these for the present, but has assigned no reason for this action. The Pennsylvania Lines West are in the market for 7000 kegs of standard spikes, and this business will be closed shortly and will likely go to two local makers. The Central Railroad of Georgia is also in the market for 1500 kegs of standard spikes for early delivery. The demand for standard and small spikes is reported more active than for some time.

We quote standard spikes, ½ to 9/16 in. and larger, $4 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, ⅝ in. and 7/16 in., $4.50; 5/16 in., $5; boat and barge spikes, $4.25 f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Iron and Steel Pipe.—Output of steel tubular goods by the National Tube Co. in May was as large as any month in its history in spite of the railroad strike and the operating troubles incident thereto. Its shipments all through the month were 80 per cent or better of production. Mills report the demand for iron and steel merchant pipe and also for oil well tubular goods is still heavy, but not as urgent as some time ago. The mills are selling very little, as their present obligations will take their output over the remainder of this year, so that most of the new business being placed is going to the jobbers. Operations of the pipe mills in the Youngstown, Ohio, district are now on a larger scale than at any time since the railroad strike started nearly three months ago. Discounts on iron and steel pipe are given on page 1697.

Coke.—Shipping connections in the coke regions show very little improvement. Producers report that on some days their supply of cars will run 50 to 60 per cent of normal and then for two or three days they will get practically no cars. The great trouble is the supply of empties, in which there is an acute shortage. Negotiations are on for some large coke contracts for delivery running over last half of this year, and the outlook now is that prices of coke for last half of this year will be higher than in the first half. Some leading producers have stated that their idea as to prices of coke on a sliding scale basis would be on the ratio of four and a half to one; in other words, four and a half tons of coke to a ton of basic iron. The present price of basic iron is $43.50, Valley furnace, and on a four and a half to one ratio this would mean very close to $10 per net ton for standard furnace coke. A considerable amount of blast furnace and foundry coke is being sold for prompt shipment on the basis of $14 for furnace and $15 to $16 for foundry. Output of coke in the upper and lower Connellsville regions last week was about 160,000 tons, a slight increase over the previous week. We quote standard grades of blast furnace coke at $14 to $15 and 72-hr. foundry coke at $15 to $16 per net ton at oven.

Old Material.—Some leading local consumers of scrap seem to be taking more interest in the market and the general feeling from the dealer's standpoint is better. However, prices as yet show very little tendency to advance, a few sales of heavy steel having been made recently at about $25.50, delivered to consumers' mills. There is no demand for heavy turnings for blast furnace practice, but dealers report that railroad conditions are better and delivery of scrap to consumers is heavier than for some time. Dealers firmly believe that with the present scarcity of pig iron and the high prices ruling for basic iron, prices on all grades of scrap for open-hearth purposes are certain to show betterment in the near future. The market is reported fairly firm, but prices are unchanged.

We quote for delivery to consumers' mills in the Pittsburgh and other districts that take Pittsburgh freight rates, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$25.00 to $25.50
No. 1 cast for steel plants	34.00 to 35.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	32.00 to 33.00
Compressed steel	22.00 to 22.50
Bundled, sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	16.00 to 16.50
Bundled, sheet stamping	15.00 to 15.50
No. 1 busheling	17.50 to 18.00
Railroad grate bars	26.00 to 26.50
Low phos. melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	30.00 to 30.50
Railroad malleable	30.00 to 30.50
Iron car axles	37.00 to 38.00
Locomotive axles, steel	34.00 to 35.00
Steel car axles	31.00 to 32.00
Cast iron wheels	40.00 to 41.00
Rolled steel wheels	29.00 to 30.00
Machine-shop turnings	15.00 to 15.50
Sheet bar crop ends (at origin)	28.00 to 28.50
Heavy steel axle turnings	20.00 to 21.00
Heavy breakable cast	32.00 to 32.50
Cast iron borings	17.00 to 17.50
No. 1 railroad wrought	31.00 to 32.00

Chicago

CHICAGO, June 8.

Reports concerning railroad service are so conflicting that it is difficult to appraise the situation, although it would appear that general conditions are no better than heretofore. The Illinois Steel Co., in fact, is worse off than a week ago as regards car supply, now having an accumulation of 120,000 tons of finished material piled in its yards. From an operating standpoint, however, it has shown slight improvement, having refired two blast furnaces which had been temporarily banked. Deliveries of coking coal from the East are still exceedingly unsatisfactory; indeed, both the foremost interest and the leading independent are on a hand-to-mouth basis, and while production now ranges from 75 to 80 per cent of capacity, a curtailment may prove necessary at any moment. The fuel problem is generally serious throughout this district, but some of the smaller mills have succeeded in maintaining a high rate of production because their requirements could be more easily filled through purchases of spot coal. In few cases, however, have plants been able to accumulate sufficient stocks to remove the uncertainty as to future operation. The difficulty experienced in buying coal even at premiums led the leading independent to purchase a low volatile coal mining property in the New River district in West Virginia. While the present output is not large enough to prove of immediate assistance, development will render the property invaluable as a future source of supply. The fuel situation affects not only the mills but most industries in this district. Foundries are experiencing unending difficulty in securing their coke needs and automobile plants have been forced to curtail output. The reduction in automobile production may not be entirely due to transportation, however, as report has it that there has been a decided slump in the demand for all except the cheaper cars. That employees of automobile plants have been permanently laid off is indicated by the fact that many of them, particularly from Detroit, have made their appearance at local steel plants, looking for work. But whatever may be the situation in the automobile market, the fact remains that industrial production generally has been exceedingly uncertain and subject to costly interruptions. In the opinion of an officer of a prominent steel mill, the railroad strike has been the most expensive labor disturbance the country has ever experienced.

The market during the past week has been rather apathetic. Possibly current political events have contributed to this condition, and more than likely the ascendancy of operating problems, together with the softening of markets in other commodities, has introduced an element of caution. Plates and structural shapes are slow and pig iron, cast-iron pipe and scrap are inactive. On the other hand, bars and sheets are still much in demand, although less is heard of premiums on the latter material.

In connection with mild steel bars, little has been heard of late as to what eastern independents would quote on business for extended delivery. A western independent continues to take care of its customers at 3c., Pittsburgh, while the leading local independent is out of the market. On prompt shipments, eastern mills are getting from 3.75c. to 4c., Pittsburgh. Bolts and nuts are exceedingly strong and on much business higher prices are the rule. The demand for wire products is active, but here again premium business is on the decline.

Although the domestic market is on the whole slower than earlier in the year, foreign demand is good except from the Far East. Sales of billets, sheet bars and plates have been made to European countries, while considerable inquiry for sheets and bars emanates from South America. On billet and sheet bars the leading local independent is quoting $70 to $75, mill.

Pig Iron.—The market is quieter than it has been at any time this year. There continues to be a small movement of spot iron, but otherwise there is practically no activity. On the whole, prices remain firm, although here and there slight recessions are to be noted. A few lots of Virginia foundry iron have recently been sold in this district at $41 base, Birmingham. On the other hand, the Virginia Iron, Coal & Coke Co. has advanced its price to $45, furnace. A few cars of spot malleable were recently disposed of at $45 Valley, or $1.25 below the ruling price of a week or two ago in this market. An order for 200 tons of 7 per cent silvery was closed at less than the Red River quotation, which itself is $3 below the Jackson County price. It is generally believed the melters in this district still have considerable iron to buy for last half. Although some of them have lost automobile business, this has been made up by orders from other sources. Convinced that foundries have plenty of work on their books, sellers believe that it is only a question of time when the market will revive. The Thomas Furnace Co., Milwaukee, expects to blow in its blast furnace about June 15. Its output will be both low phosphorus and malleable.

The following quotations are for iron delivered, at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, averaging sil. 1.50 (other grades subject to usual differentials), deliv. at Chicago...	$57.50
Northern coke, No. 1, sil. 2.25 to 2.75.	45.25
Northern coke foundry, No. 2, sil. 1.75 to 2.25.....	43.00
Northern high phos. foundry.....	43.00
Southern coke No. 1 foundry and No. 1 soft sil. 2.75 to 3.25.....	50.20
Southern coke No. 2 foundry sil. 2.25 to 2.75.....	48.70
Southern foundry sil. 1.75 to 2.25...	47.00
Malleable not over 2.25 sil.....	43.50
Basic	42.00
Low phos. (copper free).....	54.00
Silvery, 7 per cent.....$56.40 to	59.80

Ferroalloys.—The market is quiet, although the leading merchant iron producer is booking occasional orders for ferromanganese for both prompt and last half delivery. It is believed that $235 material for prompt shipment has practically disappeared and that the market will soon be uniformly on a $250 basis.

We quote 75 to 80 per cent ferromanganese, all of last half, delivered, $200; part of last half, $225; spot, delivered, $235; 50 per cent ferrosilicon at $85 delivered; spiegeleisen, 18 to 22 per cent, $70 furnace.

Railroad Rolling Stock.—The Baltimore & Ohio has awarded a contract for the repair of 2000 box cars to the American Car & Foundry Co. The underframes mentioned in the plate paragraph will be applied to these cars.

Plates.—The disappointing volume of car orders, the decline in tank construction in the Southwestern oil fields and the slowing up of building activities of every character have all contributed to a curtailment in the domestic demand for plates. Inquiry from foreign countries, except those in the Far East, is active and, in a measure, may tend to balance the tendency in the home market. The leading independent is booked for about three months ahead and is taking new business at 3.77c. mill. The foremost interest is also adding to its commitments at its old price of 2.65c., Pittsburgh. On early deliveries, several Eastern independents are quoting 3.75c., Pittsburgh, while two other important interests are asking 4c. It is known that one of the latter has booked small tonnages at that figure, but, generally speaking, business is being closed at less than 4c. In fact, on a recent attractive inquiry, an independent quoted as low as 3c., Pittsburgh. Car business for the week is smaller than for some time. For 500 underframes to be built by the American Car & Foundry Co. for the Baltimore & Ohio, the leading interest will furnish 1200 tons of plates, shapes and bars. The Seaboard Air Line is in the market for 100 phosphate cars, requiring 1000 tons of plates, shapes and bars and 135 tons of axles.

The mill quotation is 2.65c. to 4c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

Bars.—Whereas an easier tone is to be observed in some other finished products, the scarcity of mild steel bars is still marked. Not only is the domestic demand of good volume, but attractive inquiries are being received from abroad, particularly from the

South American countries. Local mills have little to offer, the leading independent being sold ahead practically until the close of the year and the foremost interest also being heavily booked and willing to take on additional tonnage only under exceptional circumstances. Quotations on early delivery by eastern independents range from 3.75c. to 4c., Pittsburgh. What they would be willing to quote on contracts has not been indicated by recent transactions in this district. Bar iron and rail-carbon steel bar mills are heavily booked and continue to receive specifications in generous volume. New inquiries, however, are not developing so rapidly as in previous weeks. Inability to secure complementary materials has also forced implement manufacturers to reduce their specifications in hard steel bars. From the standpoint of production rail-carbon steel bar mills have been hampered by a shortage of rails due both to the transportation situation and a shortage of labor on the railroads, which has reduced offerings. One local mill, in fact, has found it necessary to reduce its operations to a single turn basis. Prices remain firm.

Mill prices are: Mild steel bars, 2.35c. to 4c., Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.75c. to 4c., Chicago; rail carbon, 3.75c., mill.

Jobbers quote 3.87c. for steel bars out of warehouse. The warehouse quotation on cold rolled steel bars is 5.80c. for rounds and 6.30c. for flats and squares, an extra of 15c. per 100 lb. applying to orders exceeding 1000 lb. and under 2000 lb. and an extra of 35c. for orders up to 1000 lb.

Structural Material.—The marked decline in construction work has had its effect on the demand for structural shapes, which are now easier than any other form of finished steel. New fabricating inquiries are not coming out and current awards involve small tonnages. Recent lettings include:

City of Chicago, substructure West Madison Street Bridge, 256 tons, to Bethlehem Steel Bridge Co.

Lodge for Ivanhoe Masonic Temple Co., Kansas City, 239 tons, to Haven Structural Steel Co., Kansas City.

John Obenberger Forge Co., forge shop and steel storage building, West Allis, Wis., 226 tons, to unnamed fabricator.

City of Ames, Iowa, plate girder bridge, 126 tons, to unnamed company.

Blaine County, Mont., three bridges, 105 tons, to Buhl Bridge Co., Missoula, Mont.

The mill quotation is 2.45c. to 4c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

Sheets.—While the demand is still strong, buyers are less inclined to pay large premiums for prompt materials. Purchasers are experiencing little difficulty in securing spot black at 8c., Pittsburgh, and blue annealed at 6.50c. This condition is accounted for in part, at least, by the release of material ordered by manufacturers who have been forced to curtail operations either on account of the money situation or unsatisfactory railroad service. For extended delivery also mills are showing a disposition to shade the prices heretofore quoted. Local jobbers who have been short of sheets for months are commencing to make headway in filling their stocks. While the domestic market is somewhat easier, inquiry continues to come in from foreign countries, particularly South America.

Mill quotations are 4.35c. to 6.50c. for No. 28 black; 3.55c. to 6c. for No. 10 blue annealed, and 5.70c. to 8.50c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote: Chicago delivery out of stock, No. 10 blue annealed, 7.02c.; No. 28 black, 8c.; No. 28 galvanized, 9.50c.

Wire Products.—Improved railroad service has enabled the leading producer to increase its shipments from its Western plant. Output continues to increase and accumulations in warehouses are gradually being reduced. No new business is being taken except on a replacement basis. The demand is strong, but the feverish efforts of buyers to secure nails, almost regardless of price, are no longer evident. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1697.

Cast-Iron Pipe.—Akron, Ohio, which received bids on 1800 tons June 1, has not yet made an award. Outside of an order received by the United States Cast Iron Pipe & Foundry Co. for 200 tons for an additional oil company refinery, the market is without features. Prices are firm.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $79.80; 6-in. and above, $76.80; class A and gas pipe, $2 extra.

Rails and Track Supplies.—A South American purchaser has ordered 7000 tons of standard section rails for delivery by the local mill during the coming winter. The order was accepted because the rails, though standard section, can be rolled on a light rail mill. An export order for 1200 tons of light rails has been received.

Standard Bessemer rails, $45 to $55; open hearth rails, $47 to $57. Light rails, 2.45c. to 3.50c. f.o.b. makers' mills.

Standard railroad spikes, 3.55c. to 4c., Pittsburgh. Track bolts with square nuts, 4.90c. to 5c., Pittsburgh. Steel tie plates and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 3.75c. f.o.b. makers' mills.

Bolts and Nuts.—The demand for bolts and nuts is exceptionally heavy. Not only are orders being turned down every day, but most makers are quoting the advanced prices published in this column two weeks ago and in the Cleveland market last week, with the exception that the discount on lag screws has been further reduced to 45 off. As contracts are being closed at these prices, they may be regarded as well established for this market. A few manufacturers, however, are still taking business at lower prices. Production is rapidly recovering with the improvement of transportation, but one important Western plant is now threatened by wage demands from its employees. The advanced quotations include the following: Carriage bolts, rolled threads, 30 and 10 off; cut threads, 30 off. Larger and longer, 25 off; small machine bolts, rolled threads, 40 and 5 off. Cut threads, 30 and 10 off. Larger and longer, 30 off. Lag screws, 45 off. Tapped nuts, 1c. off. Blank nuts, 1½c. off.

Jobbers quote structural rivets, 5.37c.; boiler rivets, 5.47c.; machine bolts up to ⅞ x 4 in., 30 per cent off; larger sizes, 20 off; carriage bolts up to ⅞ x 6 in., 20 off; larger sizes, 15 off; hot pressed nuts, square tapped and hexagon tapped, 50c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras are unchanged.

Old Material.—The market is very dull and weak in most items. A shortage of rerolling rails resulting from reduced offerings by the railroads and delays in transportation has caused a slight advance in that material. It is explained that the railroads are unable to secure the labor required to handle the rails and the same difficulty is hampering dealers in their operations. With reference to the latter, however, it is to be said that scrap is moving faster than at any time since the inception of the railroad strike and that old contracts are rapidly being filled. Railroad offerings include the Pere Marquette, 2500 tons, the Union Pacific 1500 tons, the Wabash 1200 tons and the Chicago & Eastern Illinois a small tonnage.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$34.00 to $35.00
Relaying rails	50.00 to 55.00
Car wheels	35.50 to 36.00
Steel rails, rerolling	32.00 to 32.50
Steel rails, less than 3 ft	25.50 to 26.00
Heavy melting steel	22.00 to 22.50
Frogs, switches and guards, cut apart	22.00 to 22.50
Shoveling steel	21.50 to 22.00
Low phos. heavy melting steel	26.00 to 26.50
Drop forge flashings	18.00 to 18.50
Per Net Ton	
Iron angles and splice bars	$30.00 to $30.50
Steel angle bars	22.00 to 22.50
Iron arch bars and transoms	31.00 to 31.50
Iron car axles	39.50 to 40.00
Steel car axles	33.00 to 33.50
No. 1 busheling	18.00 to 18.50
No. 2 busheling	12.50 to 13.00
Cut forge	22.50 to 23.00
Pipes and flues	15.00 to 15.50
No. 1 railroad wrought	25.00 to 25.50
No. 2 railroad wrought	22.50 to 23.00
Steel knuckles and couplers	22.00 to 22.50
Coil springs	23.50 to 24.00
No. 1 cast	35.50 to 36.50
Boiler punchings	23.50 to 24.00
Locomotive tires, smooth	22.00 to 22.50
Machine shop turnings	9.00 to 9.50
Cast borings	11.00 to 11.50
Stove plate	28.00 to 28.50
Grate bars	28.00 to 28.50
Brake shoes	24.00 to 24.50
Railroad malleable	25.00 to 25.50
Agricultural malleable	24.50 to 25.00
Country mixed	15.50 to 16.50

At the plant of the Hunt-Spiller Mfg. Co., Boston, gun casting, etc., last week, 30 tons of molten iron escaped from a furnace and set fire to the establishment, causing a loss estimated at between $50,000 and $100,000.

Boston

BOSTON, June 8.

Pig Iron.—Aside from approximately 2000 tons, silicon 2.75 to 3.25, southern, nearby delivery by steamer, at $45.40 furnace, which brings the alongside Boston price up to better than $51, comparatively little pig iron has sold here since last reports. An eastern Pennsylvania furnace has sold a few hundred tons No. 2 iron, last half delivery, at $46.25 furnace, and is offering additional tonnages of silicon 1.75 to 2.25 at $45, silicon 2.00 to 2.50 at $45.60, silicon 2.25 to 2.75 at $46.25 and silicon 2.75 to 3.25 at $48 furnace. Other sales reported include 300 tons West Virginia, silicon 1.75 to 2.25, spot, at $44 furnace, and 150 tons high silicon Buffalo, last half, at $46 furnace base. About 30 inquiries have been received by W. J. Breen & Co. on southern iron, silicon 2.75 to 3.25, shipped by barge to Providence, R. I., and one melter has asked the refusal of the 1200 tons due at Bridgeport, Conn. The iron will cost about $54.90 on cars at Providence and approximately the same at Bridgeport. A freer movement of freight has practically eliminated the demand for spot iron. The New Haven Railroad on Saturday last made a drive on empty cars at all its New England points for the purpose of hurrying them west and north to connecting lines. This drive eventually will result in a freer movement of pig iron into New England. Delivered pig iron prices follow:

East. Penn., sil. 2.25 to 2.75	$49.15 to $51.15
East. Penn., sil. 1.75 to 2.25	47.90 to 48.90
Cent. & West. Penn., sil. 2.25 to 2.75	49.95 to 50.95
Cent. & West. Penn., sil. 1.75 to 2.25	48.70 to 49.70
Buffalo, sil. 2.25 to 2.75	49.15 to 50.15
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
Virginia, sil. 2.25 to 2.75	49.95 to 50.95
Virginia, sil. 1.75 to 2.25	48.70 to 49.70
*Alabama, sil. 2.25 to 2.75	49.45
*Alabama, sil. 1.75 to 2.25	47.75

*Alongside Boston prices.

Coke.—The New England Coal & Coke Co. has advanced its price on foundry coke $1.50 per ton to $18.90, delivered, where the freight rate does not exceed $2.40 a ton. This advance is the second one made within a month and brings the f.o.b. ovens, Everett, Mass., price up to $16.50 per ton. The company is far behind on contract deliveries. The Providence Gas Co., Providence, R. I., has advanced its sliding scale price on coke to $14, f.o.b. ovens, or $18.40 delivered, New England points. This price is based on Connellsville prices. With the exception of the February tonnage, which was cancelled on account of car shortage, the company will, by June 30, have shipped all first half, 1920, contract coke. The company has approximately 30 days' supply of coking coals on hand.

Warehouse Business.—Two important concerns continue to quote iron and steel bars on a 6c. per lb. base and are securing business. Almost all of the other warehouses quote on a 5½c. base, so the market, at best, is two-sided. Steel is coming forward from the mills a little more freely, but a majority of warehouses report more stock going out than coming in. The Trimont Mfg. Co., Boston, has advanced cut nails 50c. per keg. Bolts and nuts, especially the smaller sizes, continue scarce and in excellent demand. The Haywood Bros. & Wakefield Co., Wakefield, Mass., willow furniture, is in the market for 10,000 to 12,000 1¼ x 3/16 in. flat head stove bolts.

Jobbers quote: Soft steel bars, $5.50 to $6.50 per 100 lb. base; flats, $6.00 to $6.85; concrete bars, $5.50 to $6.50; tire steel, $6.50 to 7.50; spring steel, open hearth, $10 to $11; crucible, $15 to $16; steel bands, $7.25 to $8.25; steel hoops, $8.25 to $9; toe calk steel, $7.25 to $8; cold-rolled steel, $8 to $10.50; structural, $6 to $6.50; plates, $6.50; No. 10 blue annealed sheets, $9; No. 28 black sheets, $9.15; No. 28 galvanized, $10.50; refined iron, $5.50 to $8; best refined, $7 to $7.50; Wayne, $8.50; band iron, $7.25 to $8; hoop iron, $8.25 to $9; Norway iron, $20.

Finished Iron and Steel.—Increased mill operations, the lifting of Boston & Maine and Boston & Albany railroad embargoes and freer movement of freight via the N. Y., N. H. & H. R. R. have made for a slightly easier feeling in the finished iron and steel markets. Common soft steel bars, screw stock, galvanized sheets, tin and black plate continue in urgent demand, but the call for special bars, alloy steel, forgings, heavy plates and structural steel has slowed up. New England rolling mills are getting fancy prices for bars, one having sold a fairly large tonnage of ⅜ in. rounds at 8c., f.o.b. shipping point, and several sales at 6c. are reported. A contractor paid a New England roller 5½c. f.o.b. mill for 1000 tons round and square concrete bars. Another roller is asking 5c. for bars made from shell billets. A Pennsylvania mill has secured better than 4c. for concrete bars, and another 4.75c. for common soft steel stock. Sales of steel bands at 6c. f.o.b. mill are reported. More new plate business has been booked the past week at 4c. than at a lower price. The Bath Iron Works, Bath, Me., is in the market for about 1500 tons of channels, bulb angles and angles for two oil tankers. No structural awards of importance are reported this week.

Old Material.—A majority of dealers report the past week the quietest one experienced this year, so far as new business goes. Many of them, however, are busy making shipments of material purchased some time ago. Further rejections by mills are reported, although this practice is not general. Aside from a decline of about $1.50 in forged scrap and bundled skeleton, prices reported are as heretofore. The undertone of the market, however, unquestionably is easy. Dealers are holding to $30 delivered for stove plate, but the largest consumer is not willing to pay more than $27. A few car wheels have sold on a $31 f.o.b. yard base. One dealer is offering car wheels at $38 f.o.b. Boston base, but admits that buyers' ideas are lower. Otherwise the market is without special feature. Old material prices, f.o.b. local yards, follow:

No. 1 railroad wrought	$27.00 to $28.00
No. 1 yard wrought	24.00 to 25.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	18.50 to 19.50
Machine shop turnings	14.00 to 15.00
Cast iron borings	15.50 to 16.00
Heavy axle turnings	15.50 to 16.50
Blast furnace borings and turnings	14.00 to 14.50
Forged scrap	13.00 to 13.75
Bundled skeleton	13.00 to 13.75
Street car axles	31.00 to 32.00
Car wheels	37.00 to 38.00
Machinery cast	38.00 to 40.00
No. 2 cast	35.00 to 36.00
Stove plate	26.00 to 27.00
Railroad malleable	26.00 to 27.00
Rerolling rails	27.50 to 28.50

Buffalo

BUFFALO, June 8.

Pig Iron.—Very little iron is being sold in this district. About the only transaction during the week involved the sale of 800 tons of foundry iron and 550 tons of malleable. One furnace interest booked the entire amount, and there was conspicuous inactivity among other interests. Of the foundry, about half was No. 2 plain, 1.75 to 2.25 silicon, at $45, and half No. 2X, 2.25 to 2.75 silicon, at $46.25. The malleable was sold at the regular price of $46.25, though it is understood that a very small portion of it with a different silicon content brought a small premium over the regular price. All of this iron was sold for delivery over the third quarter. Furnaces are concentrating on production, but are forced to pile much material. The car situation is reported to be a little better, but some furnaces are very badly off for coke. One furnace is concentrating on its low silicon commitment to wipe that off the books as soon as possible. There is strong pressure for each ton made, and furnacemen are endeavoring to distribute product equably among all customers. The fact that embargoes have held grain in elevators here for weeks is affecting the iron shipments adversely. Canalboats that ordinarily would have been used to move iron east have been chartered until the middle of July by grain interests, thus eliminating them from the iron movement.

We quote f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 sil	$48.00
No. 2 X foundry, 2.25 to 2.75 sil	46.25
No. 2 plain, 1.75 to 2.25 sil	45.00
Basic	$44.00 to 45.00
Malleable	46.25
Lake Superior charcoal	58.00 to 60.00

Finished Iron and Steel.—Some small improvement can be noticed, and it is the general opinion among shippers that the operation of freight by the car service committee is helping somewhat to clear up the congestion. There is still a grave car shortage, and

this is particularly emphatic at this time because many cars that were loaded at the time of the last switchmen's strike and held at originating points have had to proceed to destination and be unloaded before they were again available for shipment. The fact that more pressure is being exerted for placing of cars that have been in transit and the multitudinous requests for tracings of cars show that mill stocks are becoming exhausted. Material is being piled and shipped out in small lots. The inquiry for all classes of material keeps up steadily. Bar demand is strong, and so is the demand for tube material. Plates are in better demand than during the last few weeks, particularly by tank manufacturers. The concrete bar demand is fair, but very little of the inquiry is being accepted. Structural demand is light.

Jobbers quote the following prices for this territory: Steel bars, 4.61c.; iron bars, 5.26c.; structurals, 4.46c.; plates, 4.66c.; No. 10 blue annealed sheets, 6.51c.; No. 28 black sheets, 8.25c.; No. 28 galvanized sheets, 9.50c.; bands, 5.81c.; hoops, 6.06c.; cold rolled steel, 6.00c.

Old Material.—Shipments are proceeding with a little more freedom, but at the same time the dullness of the market is cutting down the number of shipments, so that this is not a strictly accurate index of transportation conditions. There is little activity and seemingly no strong disposition on the part of mills to augment their stocks. There was a sale of one lot of heavy melting steel here last week at $24. The quantity sold was something over 500 tons. A Canadian mill purchased a heavy tonnage of turnings during the week at a price said to have been $17.50 delivered. Twenty-three dollars is now being offered by a Buffalo mill which has been in the market for the past month and formerly offered $25 to $26. Dealers look for a real shortage of cars for an indefinite period. Grain shipments are taking most of the cars now, it is said. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$23.50 to $24.50
Low phos., 0.04 and under	31.50 to 32.50
No. 1 railroad wrought	30.50 to 31.50
No. 1 machinery cast	37.50 to 38.50
Iron axles	39.00
Steel axles	39.00
Car wheels	37.00 to 38.00
Railroad malleable	30.50 to 31.50
Machine-shop turnings	15.00 to 16.00
Heavy axle turnings	19.50 to 20.50
Clean cast borings	16.50 to 17.50
Iron rail	29.50 to 30.50
Locomotive grate bars	23.50 to 24.50
Stove plate	31.50 to 32.50
Wrought pipe	220.50 to 21.50
No. 1 busheling	19.50 to 20.50
Bundled sheet stamping	16.50 to 17.50

St. Louis

ST. LOUIS, June 7.

Pig Iron.—The buying of pig iron has run down to small lot purchases for urgent or special needs, and the foundries and other consumers are disinclined to make any further large commitments for the future because of the still difficult transportation situation. There has been no change in prices, and some of the consumers are reported as acting on the basis that lower rather than higher prices are to be expected. The local blast furnace of the Mississippi Valley Iron Co., which has been undergoing reconstruction, started up May 31 and is being operated at a capacity of about 400 tons per day on contracts already in effect. During the shutdown the furnace has been almost completely renewed. It is using ores from Missouri mines and from the Lake Superior districts, but none as yet from the Waukon field in Iowa.

Coke.—There has been no business during the past week in coke, the prices being against any transactions, while deliveries are also a deterrent factor. Consumers are endeavoring to get along with coke under contract, feeling that new purchases would have no beneficial effect on their supplies because of the railroad congestion.

Finished Iron and Steel.—In finished products, deliveries continue troublesome both on contracts and to and from the warehouses, with the result that fabricators and consumers generally are doing only what the supplies available will permit them to do. Receipts by rail are not much, if any, improved. Stock out of warehouse moves only as available materials permit of use, and many sizes and shapes are unobtainable.

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.50c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 7.09c.; No. 28 black sheets, cold rolled, one pass, 8.10c.; No. 28 galvanized sheets, black sheet gage, 9.60c.

Old Material.—The scrap market is still very quiet with only a little trading between dealers and here and there a small transaction on the part of consumers. Railroads are not offering any material of consequence because unable to provide cars for handling if sold.

We quote dealers' prices f.o.b. customers' works St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$31.50 to $32.00
Old steel rails, rerolling	30.00 to 30.50
Old steel rails, less than 3 ft	24.00 to 24.50
Relaying rails, standard sections, subject to inspection	50.00 to 55.00
Old car wheels	34.50 to 35.00
No. 1 railroad heavy melting steel	22.50 to 23.00
Heavy shoveling steel	21.00 to 21.50
Ordinary shoveling steel	20.50 to 21.00
Frogs, switches and guards, cut apart	23.00 to 23.50
Ordinary bundled sheets	13.00 to 13.50
Per Net Ton	
Heavy axle and tire turnings	15.00 to 15.50
Iron angle bars	28.00 to 28.50
Steel angle bars	21.00 to 21.50
Iron car axles	39.50 to 40.00
Steel car axles	32.50 to 33.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	25.50 to 26.00
No. 2 railroad wrought	23.50 to 24.00
Railroad springs	21.50 to 22.00
Steel couplers and knuckles	22.00 to 22.50
Locomotive tires, 42 in. and over, smooth inside	20.00 to 20.50
No. 1 dealers' forge	20.00 to 20.50
Cast iron borings	13.50 to 14.00
No. 1 busheling	19.50 to 20.00
No. 1 boiler, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast	35.00 to 35.50
Stove plate and light cast	27.00 to 27.50
Railroad malleable	25.00 to 25.50
Agricultural malleable	24.00 to 24.50
Pipes and flues	17.00 to 17.50
Heavy railroad sheet and tank	16.50 to 17.00
Railroad grate bars	26.00 to 26.50
Machine-shop turnings	12.00 to 12.50
Country mixed	17.50 to 18.00
Uncut railroad mixed	18.00 to 18.50
Horseshoes	24.50 to 25.00

Birmingham

BIRMINGHAM, ALA., June 7.

Pig Iron.—Last week was perhaps the quietest the Birmingham market has experienced in some time, but a fair volume of small lots for spot delivery was booked and some additional export was taken on. New England also made further bookings for movement by rail and water through Savannah, a movement that has assumed proportions since the vogue of the car congestion. The export bookings are also partly due to the car situation, the shipment of metal to foreign countries being feasible since ship room at southern ports has become larger. Among the export bookings by one concern were 1000 tons each for Holland, Scotland and Sweden and 1500 tons for Italy. The Swedish order is expected to reach 2000 tons, following negotiations now under way. Larger producers ask $42 and no more with practical uniformity, but $43 and $44 continue to be charged by brokers for small spot lots to be had of the small operators. A foreign offer of charcoal iron was not accepted on account of pressure of prior bookings. One shipping company has offered to take 1000 tons of any grade of iron of any analysis for export. The iron is probably needed for ballast and the shipping concern will take chances on its resale. Alabama furnaces are working well and the output is the largest of the year. The Gulf States Steel Co. will blow in its stack on basic June 26. While the market is quiet owing to the car congestion, makers believe it is intrinsically strong and look for a very active demand as soon as the transportation situation eases up. They base this conclusion on the small amount of iron on hand and the small unsold capacity. Furnaces, for the first time in several months, have recently begun to pile iron on yards, but there was very little there when this commenced.

We quote per gross ton, f.o.b. Birmingham district furnaces, the Tennessee company excepted, as follows:

Foundry, sil. 1.75 to 2.25	$42.00 to $44.00
Basic	41.00 to 43.00
Charcoal	55.00

Cast Iron Pipe.—Water-pipe orders came in considerable quantities the past week. Gastonia, N. C., ordered 1000 tons of 12-in. and Clarksdale, Miss., 200 tons of 10-in., many other municipalities, principally in the Carolinas, placing small orders. The movement of 7000 tons of gas and water pipe from the United States Cast Iron Pipe & Foundry Co. plants at Bessemer, Birmingham, Anniston and Chattanooga via steamer from Mobile to the Pacific Coast at Los Angeles and San Francisco was economical and successful. The ocean voyage was two weeks. Three new sanitary pipe shops will come in during July.

Coal and Coke.—Coke is extremely hard to get. The Alabama By-Products Co. enjoys the gilt-edged trade by having recently come in without prior bookings. Its foundry coke is going all over the country and commanding as high as $15 per ton. Other makers have none to spare from old contracts. Their prices vary from $11 to $12.

Old Material.—The scrap market is unusually dull except for the regular movement of cast scrap. The steel consumers have hammered the market down around $1 a ton on actual sales.

We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$21.00 to $22.00
No. 1 steel	19.00 to 20.00
Cast iron borings	14.00 to 15.00
Machine shop turnings	14.00 to 15.00
No. 1 cast	34.00 to 35.00
Car wheels	32.00 to 33.00
Tramcar wheels	31.00 to 32.00
Steel axles	29.00 to 30.00
No. 1 wrought	26.00 to 27.00

Cincinnati

CINCINNATI, June 8.

Pig Iron.—The market is a shade more active than has been the rule for several weeks past and while inquiries consist mostly of small lots for prompt shipment, an occasional one is received for third quarter needs. Included in the latter is an inquiry for 4000 tons of foundry iron from a melter in the Northwest. There is also some inquiry out for malleable and charcoal iron from other districts, one of 750 tons of malleable coming from St. Louis. Some interest is also being shown in low phosphorus iron from the St. Louis district. No action has been taken locally on the 10,000-ton inquiry for basic reported last week. Export orders placed during the week total in the neighborhood of 2000 tons, the greater part of this going to Belgium and Holland. Prices remain firm with no disposition apparent on the part of sellers to quote lower than those ruling at present. Furnaces are reported to have strong order books and are not actively soliciting new business. Sales noted during the week include one of 300 tons of Southern foundry, silicon 2.25 to 2.75, to a Kentucky melter at $43.75, furnace, which with a four per cent differential figures back to $42 for the base grade, and one of 300 tons to an Ohio melter at $42 for the base grade.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price)	$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	46.85
Ohio silvery, 8 per cent sil	59.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	46.80
Basic Northern	41.80
Malleable	$45.80 to 46.80

Coke.—Some foundries in this district are reported to be having difficulty securing coke and some are slowing down in operations. Car shortage is reported as beginning to be felt in the South and one producer is reported to be piling iron. The movement of coke from the Connellsville field is reported as somewhat improved. Prices, however, which were expected by some sellers to take a drop after June 1, are still strong and Connellsville coke, both furnace and foundry, is quoted at $15 to $16. Some sales have been made at higher prices, but the above prices about represent the market. No coke is available from the New River or Wise County fields. Some furnaces which have been having difficulty securing shipments of coke on low priced contracts are reported to have agreed to a revision of the price clause when operators claimed that they were unable to deliver the coke except at a loss.

Finished Material.—Some improvement is noticed in deliveries of finished material, and one wire and nail mill is now in a position to take on business for delivery in about 90 days. The demand continues for sheets, and mills are reported as having their entire third quarter output sold. There is also a heavy demand for bars, bands, hoops, and cold-rolled shafting, but plates and shapes are quiet. No structural lettings are reported from this territory during the week, though a number of buildings contemplated in Kentucky cities are about to be put up for bids. Warehouses report business as very good and deliveries greatly improved, though with the heavy demand they are not able to add to their stocks; as soon as material is received from the mills it is shipped out to their customers. Prices on the whole show no change, though warehouses have advanced the price on steel bands from 6.25c. to 6.50c. Small structural shapes, which are very difficult to secure from mills, are quoted at 5.50c. to 7c. Nails are quoted at $4.50 per keg base, though a number of mills are quoting $2.00 over this price.

Jobbers quote: Iron and steel bars, 5c. to 6c.; structural shapes, 5.10c.; plates, 5c.; steel bands, 6.50c.; No. 10 blue annealed, 7.50c.; No. 28 black sheets, 9c. to 10c.; No. 28 galvanized sheets, 10c. to 11c.

Tool Steel.—The tool steel market is quiet, not much business being placed just now. This is accounted for by the fact that a number of machinists are on strike, and some of the plants are running short-handed; consequently production is somewhat curtailed. Some sellers report that prices are inclined to stiffen on high speed steels, as raw materials entering into their composition are higher than they have been for some time. Prices are still quoted at $1.25 to $1.30 for high speed steel containing about 18 per cent of tungsten.

Old Material.—The scrap market is more active as regards inquiry, but few of those are developing into sales, consumers figuring that prices asked are too high.

Per Gross Ton

Bundled sheets	$15.00 to $16.00
Old iron rails	27.00 to 28.00
Relaying rails, 50 lb. and up	48.00 to 49.00
Rerolling steel rails	29.00 to 30.00
Heavy melting steel	21.50 to 22.50
Steel rails for melting	24.00 to 25.00
Car wheels	29.00 to 30.00

Per Net Ton

No. 1 railroad wrought	$25.00 to $26.00
Cast borings	11.50 to 12.00
Steel turnings	9.50 to 10.00
Railroad cast	31.00 to 32.00
No. 1 machinery	35.00 to 36.00
Burnt scrap	22.00 to 23.00
Iron axles	29.50 to 30.00
Locomotive tires (smooth inside)	23.50 to 24.50
Pipes and flues	16.00 to 16.50
Malleable cast	22.00 to 22.50
Railroad tank and sheet	16.00 to 16.50

New York

NEW YORK, June 8.

Pig Iron.—Increasing inquiry for pig iron from England, Scotland, Sweden, Italy and other countries and the willingness to buy at or above domestic prices indicate that it would be possible to export a large tonnage provided the iron could be obtained, but furnaces are not disposed to make promises in this regard. Prices are well maintained on the basis of $46 to $47, Eastern Pennsylvania furnace; $45 to $46, Buffalo; and $45, Virginia. Reports of sales of Virginia iron at $43 are due to a tonnage of off iron which has been disposed of at about that figure. The railroad situation so far as a strike is concerned has improved, but now the trouble seems to be scarcity of cars rather than of men to handle the cars. With foundry coke selling in New England at $16.50, Everett ovens, the costs of making castings are very high. For this reason and also on account of slowness of delivery of materials,

the business of the New England foundrymen is beset by unusual difficulties nowadays.

We quote for delivery in New York as follows:

East. Pa., No. 1 fdy., sil. 2.75 to 3.25	$50.05 to $51.05
East. Pa., No. 2X fdy., sil. 2.25 to 2.75	49.05 to 50.05
East. Pa., No. 2 fdy., sil. 1.75 to 2.25	47.80 to 48.80
Buffalo, sil. 1.75 to 2.25	47.90 to 48.90
No. 2 X Virginia, sil. 2.25 to 2.75	49.60

Ferroalloys.—The ferromanganese market is unchanged at $225 to $250 for June shipment with $200, delivered, asked by domestic producers for last half and a limited amount of British alloy quoted at $195, seaboard, for shipment from August on. Buying is exceedingly light for either early or last half delivery. A rumor that a Pennsylvania consumer had purchased 200 tons for $200, delivered, for June delivery is unconfirmed. Imports of ferromanganese in April were 3018 tons, which is slightly above the monthly average for the first quarter of this year and for 1919. Revised figures of the production of ferromanganese by blast and electric furnaces will show over 22,000 tons for May, the largest for any month this year. The spiegeleisen market is also quiet but firm at $75, furnace, at which level only light sales are reported. Production for May was close to 12,000 tons. This compares with over 6600 tons in April and 15,400 tons in March. The manganese ore market is very firm at around 80c. to $1 per unit, depending upon the delivery and quantity involved. Imports for April were 35,088 tons, bringing the total for the 10 months ended April 30, 1920, at 186,986 tons, which compares with 441,258 tons of the same 10 months ended April 30, 1919. Very little change in the 50 per cent ferrosilicon market is noted, quotations being largely nominal at $80 to $90 per ton for early delivery.

High Speed Steel.—Prices remain at $1.25 to $1.30 per lb., New York. Shortage of vanadium in England is so acute as to cause American producers of high speed steel to look forward to a considerable export business.

Warehouse Business.—Transportation improvement is enabling warehouses to make some shipments. Local inquiries and orders are heavy, but some warehouses report that out-of-town customers who have been forced by material shortage to curtail production in some lines have not yet begun to buy. Numerous small export inquiries are being received. Prices are unchanged.

Finished Iron and Steel.—Buyers have, for the most part, adopted a waiting attitude; in some instances they frankly tell sellers they are looking for lower prices, particularly on plates and shapes. These commodities, in fact, show further softening tendency, plates now being purchaseable at 3.50c. to 3.75c., Pittsburgh, from independent mills, even when specification plates are wanted. One large buyer of boiler steel is reported to be filling its wants at 3.50c., base. Some of the plate mills are hungry for business, and in a less degree this is also true of some of the shape mills. Such mills have plenty of orders on their books, but there are still many points that they cannot ship to, and hence they are looking for new tonnage. In a few instances plate mills are making a more active canvass for plate orders than they have in many months. In structural work, the quiet season of the year is now at hand, and while there are many large building projects pending, which will eventually come into the market, it is probable that steel for the most of these will not be ordered before fall. New bids have been requested for the East Chester Creek bridge, New York, 600 tons. In other steel products the situation is without change. Steel bars are still in demand, and 4.25c., Pittsburgh, has been gotten by an Eastern mill for 600 tons for September-October shipment. The Youngstown Sheet & Tube Co. has placed an order with Cambria Steel Co. for 500 70-ton hopper cars, and the Donner Steel Co. is reported to be contemplating the purchase of 1000 cars of similar type.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.52c.; shapes, 2.72c. to 4.27c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the highest prices for delivery in a few weeks; bar iron, flats, wider than 6 in., 4.57c.; ⅝ and 7/16 in., round and square, 5.27c.; light rounds, squares and flats, 5.77c., and other sizes, 4.27c.

Cast-Iron Pipe.—Bids were turned in last week on an inquiry for 2500 tons of 48-in. pipe for the city of Akron, Ohio, this being the largest asking for some time. The present high prices do not seem to be curbing either inquiries or orders and makers are booked for nearly the rest of the year. We quote 6-in. and heavier at $76.30, New York; 4-in., $79.30, with $2 additional for Class A and gas pipe.

Old Material.—Though the car situation is better, new business is no better and the shading of prices continues. Embargoes against the shipment of heavy melting steel are in effect, both for the Bethlehem Steel Co. and Alan Wood Iron & Steel Co. Dealers and brokers say they will be content to make expenses only for a few months. One New York broker has reduced buying prices on 15 items from 25c. to $1 over a week ago.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$19.00 to $19.50
Rerolling rails	29.00 to 30.00
Relaying rails, nominal	52.00 to 54.00
Steel car axles	38.00 to 39.00
Iron car axles	42.00 to 43.00
No. 1 railroad wrought	30.00 to 31.00
Wrought iron track	22.00 to 22.50
Forge fire	14.00 to 14.50
No. 1 yard wrought, long	23.50 to 24.00
Light iron	9.00 to 10.00
Cast borings (clean)	16.50 to 17.00
Machine-shop turnings	15.00 to 15.50
Mixed borings and turnings	15.00 to 15.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long)	19.50 to 20.00
Stove plate	25.50 to 26.00
Locomotive grate bars	27.00 to 28.00
Malleable cast (railroad)	29.00 to 30.00
Old car wheels	35.00 to 37.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:

No. 1 machinery cast	$38.00 to $39.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	38.00 to 39.00
No. 1 heavy cast, not cupola size	30.00 to 31.00
No. 2 cast (radiators, cast boilers, etc.)	31.00 to 32.00

Cleveland

CLEVELAND, June 8.

Railroad transportation shows further improvement in this terriotry, but the car supply is very short and this shortage is greatly interfering with movement of freight. Embargoes against many points were lifted during the week, but mills and blast furnaces are having as much trouble as at any time in reaching some points. They are also experiencing much difficulty in making shipments that are to be switched to other lines. The coal shortage in Cleveland has become acute and there is danger that the power supply to many manufacturing plants will have to be curtailed.

Iron Ore.—The Interstate Commerce Commission, on application of some of the coal shippers, has authorized the pooling of coal for Lake shipments on the same basis as was used in 1918. The position taken by the commission in respect to fuel leads some of the ore people to believe that similiar action will be taken as to ore, so that shipments to consumers will be prorated according to requirements. Coal shippers were in favor of a pooling arrangement under the authority of the Ore and Coal Exchange, but ore shippers are divided on the subject of prorating ore, and at a recent meeting were unable to reach an agreement. Then the matter was submitted to the Interstate Commerce Commission, and a ruling in respect to ore is expected this week. Ore shipments from lower Lake ports are improving, but the car supply is still short, and boats are being delayed in unloading cargoes. Ore shipments by water in May reached 6,976,085 gross tons, an increase of 360,744 tons over May, 1919. The movement up to June 1 was 7,206,939 tons as compared with 8,027,580 tons in the corresponding period last year. However, the early season movement in 1919 was light and, making comparison with the previous year, shipments to June 1 were 1,821,162 tons lower than the movement during the same period 1918, when 9,028,101 tons was moved. Ore shippers do not expect that curtailment in shipments will cause a serious shortage in the ore supply next winter, as the requirements of many furnaces

have been reduced because of slowing down and banking of furnaces during the past few weeks on account of coal and coke shortage due to the railroad strike. However, some furnaces were able to keep in operation to full capacity during the strike, and ore men state that some of these may run short of ore next winter.

We quote, delivered lower Lake ports: Old range Bessemer, $7.45; old range non-Bessemer, $6.70; Mesaba Bessemer, $7.20; Mesaba non-Bessemer, $6.55.

Pig Iron.—The railroad situation has improved to such an extent that most consumers in the foundry trade have sufficient iron to relieve them of anxiety and have ceased urging furnaces to make immediate deliveries. However, they are advising furnaces they will be glad to have additional shipments to further increase their stocks. Most furnaces are now shipping all of their output, but some are still forced to pile iron because of scarcity of cars. The situation in New England has eased up materially, and Central Western furnaces are now freely shipping pig iron into the territory. Permits are no longer required except by one railroad. The market continues quiet. A St. Louis territory consumer has purchased 5000 tons of early shipment basic iron, 1500 tons of which went to a Lake furnace at $43, to supply a shortage due to its inability to secure shipment from other sources. An inquiry from southern Ohio for 10,000 tons of basic iron is still pending. Prompt shipment iron in small lots is still in fair demand, and several sales are reported at $44 for No. 2 foundry and at $44.50 for malleable. A Pittsburgh district car wheel manufacturer has placed 2000 tons of malleable iron. We also note the sale of 400 tons of foundry iron to an Elyria, Ohio, consumer for the third quarter.

We quote delivered Cleveland, as follows, based on 40c. switching charge for local iron, a $1.40 freight rate from Valley point, and $5 from Birmingham:

Basic	$43.40
North. No. 2 foundry, sil. 1.75 to 2.25	$44.40 to 45.40
Southern foundry, sil. 2.25 to 2.75	48.70
Gray forge	41.40
Ohio silvery, sil. 8 per cent	61.40
Standard low phos., Valley furnace	51.00 to 53.00

Finished Iron and Steel.—Demand for finished iron and steel is light, but there is a fair volume of inquiry for steel bars and very active demand from manufacturers for wire. Some wire orders are being placed for the third quarter at 4c. Plates and structural material are quiet. Mills are quoting tank plates at 3.50c. to 3.75c., but 4c. is still the ruling price for boiler plates. Practically no building work is being placed. Many projects are still being held up because of the scarcity of material and the financial situation. The slump in building has resulted in the falling off in demand for reinforcing bars and hard steel bars are now freely quoted at 3.75c. The demand for steel from the automobile industry, including the parts and rim manufacturers, is apparently about as heavy as ever in spite of the slowing up in the industry. Operations at local plants in the automotive industry are at from 50 to 100 per cent capacity. Reports indicate that Detroit motor car plants are now running on an average of 75 per cent.

Cleveland warehouses quote steel bars at 3.27c. to 5c.; plates, 3.57c. to 5c., and structural material, 3.70c. to 5.10c.

Sheets.—The demand for sheets in light gages continues very heavy. A leading Detroit automobile builder is inquiring for a round tonnage of sheets for car frames and another is in the market for 5000 tons of automobile body sheets. High prices are still quoted by a few of the mills, but consumers are less inclined to pay excessive premiums, although sales of black sheets are reported at as high as 9c. Automobile body sheets are quoted at 7.85c. to 8c. for No. 22 gage. We quote black sheets at 7c. to 7.50c., blue annealed at 5.75c. to 6.25c. and galvanized sheets at 7.25c. to 8c.

Coke.—The supply of foundry coke has eased up considerably with improved shipments. Inquiry for spot shipment fuel has fallen off, although foundries at a few northern Ohio points are still urgently in need of coke. Quotations on foundry coke for early shipment cover a wide range of from $13 to $16 per net ton. Producers are asking $15 for furnace coke.

Bolts, Nuts and Rivets.—There is a heavy inquiry from jobbers, railroads, automobile and implement manufacturers for bolt and nut contracts for the third quarter and last half, but most makers are limiting their sales to third quarter. Shipments have materially improved owing to the lifting of embargoes against many points, and raw material is coming in somewhat better. There is good inquiry for rivets for third quarter and last half, and makers are taking orders subject to their ability to fill. The Champion Rivet Co. is operating its Cleveland plant at 40 per cent capacity, but now has the Chicago plant in full operation.

Old Material.—Scrap is moving more freely than a week ago, owing to an improvement in the railroad situation. The market is dull, but prices are steadier than for some time, and there were no further declines during the week. A northern Ohio consumer has purchased 1000 tons of heavy melting steel at $24.50, and dealers are asking that price for Cleveland delivery. Sales of compressed steel scrap are reported at $20.50 to $20.75 to dealers for delivery to a Valley mill. Dealers still have orders for large tonnage on their books, and with the easing up of the railroad situation are devoting their attention largely to moving this material, much of which was sold at considerably higher prices than are prevailing at present. Prices are unchanged.

Dealers quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$23.50 to $24.00
Steel rails, under 3 ft	25.00 to 27.75
Steel rails, rerolling	31.00 to 32.00
Iron rails	32.00 to 33.00
Iron car axles	41.00 to 42.00
Steel car axles	36.00 to 37.00
Low phos. melting scrap	26.25 to 26.50
Cast borings	16.50 to 16.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	15.50 to 16.00
Short turnings for blast furnaces	15.50 to 16.00
Compressed steel	18.25 to 18.75
Railroad wrought	28.00 to 29.00
Railroad malleable	30.00 to 31.00
Steel axle turnings	19.50 to 20.00
Light bundle sheet scrap	15.00 to 15.50
Drop forge flashings over 10 in.	14.50 to 15.00
Drop forge flashings under 10 in.	16.50 to 17.00
No. 1 cast	41.00 to 42.00
No. 1 busheling	18.50 to 18.75
Railroad grate bars	29.00 to 30.00
Stove plate	29.00 to 30.00
Cast iron wheels	37.00 to 38.00

Philadelphia

PHILADELPHIA, June 8.

Except for the placing of about 15,000 tons of plates, shapes and bars by the Pennsylvania Railroad and the ordering of steel for upward of 200 locomotives, the past week has been devoid of noteworthy developments. In general, the markets have had one of the quietest weeks in nearly a year. All of the Pennsylvania Railroad business is reported to have gone to the leading interest. Deliveries are to be made throughout second half. The bulk of the tonnage is to consist of plates, but there are also about 2000 tons of shapes and a like tonnage of bars.

In pig iron there is scarcely any activity, except a few sales for prompt shipment, generally small lots, but it is interesting to note that at the meeting last week of the Eastern Pig Iron Association figures were shown that indicate that at the present rate of production eastern merchant furnaces will need very little, if any, more tonnage to fill out the year. Pig iron is firm. Scrap is weak, and there is further evidence of softening in at least two forms of finished steel, plates and shapes, notably the former. Bids of independent producers on the Pennsylvania plate tonnage ranged from 3.25c. to 4c., Pittsburgh. On miscellaneous business 3.50c. is more frequently quoted. Some of the plate mills find themselves in urgent need of orders because of their inability to ship to many points. Shapes are quoted at from 3.25c. to 3.75c., Pittsburgh, but it is possible that even the lower figure can be bettered on desirable specifications.

Pig Iron.—The market is extremely quiet, but prices are firm. Most foundry consumers are fairly well covered for the year, and likewise most of the eastern

merchant furnaces are sold up also to the end of the year. There is some free iron for fourth quarter. Spot iron is available because the furnaces cannot ship to all points. The demand for prompt iron is not large, but a few sales have been made in lots from a carload up to 500 tons. Figures produced at the meeting of the Eastern Pig Iron Association show that the eastern merchant furnaces, as a whole, have sold all the iron that they can produce this year at the present rate of production. The principal maker of malleable iron in the East is quoting $47 to $47.50, furnace, with $1.10 freight rate, but otherwise iron prices are unchanged.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

East. Pa., No. 2 X, 2.25 to 2.75 sil.	$47.15 to	$49.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	45.90 to	48.10
Virginia No. 2 plain, 1.75 to 2.25 sil.		49.10
Virginia No. 2 X, 2.25 to 2.75 sil.		50.35
Basic deliv. eastern Pa.		44.80
Gray forge	43.00 to	44.00
Standard low phos. (f.o.b. furnace)		52.00
Malleable	48.10 to	48.60
Copper bearing low phos. (f.o.b. furnace)		47.00

Ferroalloys.—The demand for ferromanganese is light, but prices remain firm, $200, delivered, being generally quoted for last half.

Semi-Finished Steel.—Little semi-finished steel is being sold, but open-hearth rerolling billets, 4 x 4 in. and larger, are quoted at from $60 to $70, Pittsburgh, while forging billets are quoted at from $75 to $85, Pittsburgh.

Plates.—The softening of plate prices has become more noticeable. On the Pennsylvania Railroad plate tonnage, it is reported that quotations of independents ranged from 3.25c. to 4c., but the entire order, about 13,000 tons, went to the leading interest. Other notable plate business of the week was from a locomotive builder, who covered for upwards of 200 locomotives. A car builder has inquired for 5000 tons. Production of plates is somewhat better, ranging from 75 to nearly 100 per cent among eastern mills. The disposition of certain mills to quote lower prices is attributed to the fact that, while rollings are heavy, there are many points still under embargo, and it is necessary to stir up new business to fill out schedules. One mill, whose prices have been strong at 4c., Pittsburgh, is reported to have gone under this price on several occasions. Some mills openly quote 3.50c., Pittsburgh, while 3.75c. can easily be done. We quote plates, 1.4 in. and heavier, at 3.50c. to 4c., base, Pittsburgh, from independent mills, and at 2.65c., Pittsburgh, from the leading interest, with indefinite deliveries in the latter case.

Old Material.—The market is quiet and soft, but there have been no changes in prices during the week. Trading is mostly among dealers. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$22.50 to	$23.00
Steel rails rerolling	32.00 to	33.00
No. 1 low phos., heavy 0.04 and under	30.00 to	31.00
Car wheels	38.00 to	40.00
No. 1 railroad wrought	33.00 to	34.00
No. 1 yard wrought	27.00 to	28.50
No. 1 forge fire	18.50 to	19.00
Bundled skeleton	18.50 to	19.00
No. 1 busheling	20.00 to	21.00
No. 2 busheling	17.00 to	18.00
Turnings (short shoveling grade for blast furnace use)	18.00 to	19.00
Mixed borings and turnings (for blast furnace use)	17.50 to	18.00
Machine-shop turnings (for rolling mill and steel works use)	18.50 to	19.00
Heavy axle turnings (or equivalent)	20.00 to	20.50
Cast borings (for rolling mills)	20.00 to	21.00
Cast borings (for chemical plants)	21.50 to	22.50
No. 1 cast	37.00 to	38.00
Railroad grate bars	31.00 to	33.00
Stove plate (for steel plant use)	28.00 to	29.00
Railroad malleable	28.00 to	29.00
Wrought iron and soft steel pipes and tubes (new specifications)	22.50 to	23.50
Iron car axles	45.00 to	46.00
Steel car axles	42.00 to	44.00

Structural Material.—There is practically no new building activity. Some shape mills are in need of tonnage. It is fairly easy now to place orders at 3.25c., Pittsburgh, among independent mills, while 3.75c. is probably the top. The Pencoyd works of the American Bridge Co. has been seriously handicapped in operations by difficulty in bringing sufficient raw materials from Pittsburgh.

Bolts.—Some makers of iron bolts have advanced prices about 10 per cent. Instead of 30 and 10 per cent off on large machine bolts, they now quote 30 per cent off list, with other sizes in proportion.

New Britain Malleable Foundry Sold

The Malleable Iron Works, New Britain, Conn., whose foundry was built 57 years ago, has been sold to a company of capitalists of Auburn, N. Y., headed by George W. Bowen, president Bowen Products Corporation, Auburn, Detroit, Minneapolis and Cleveland. The output of malleable iron and gray iron castings will be used henceforth almost exclusively for supplying the agricultural, automobile and tractor industries. It is the intention of the new management to increase the output and the number employed.

The new officers are: President, George W. Bowen; secretary, Walter H. Beck; treasurer, George W. Benham; assistant treasurer and general manager, Harold Putnam. Mr. Bowen is also president of the Henry & Allen Co., Auburn, and is with the Rutenber Motor Co., Marion, Ind. Mr. Beck is vice-president and general manager of the Henry & Allen Co. and Mr. Benham is vice-president and treasurer of the Auburn Trust Co., Auburn. Mr. Putnam is in direct charge of the malleable iron foundry of the International Harvester Co. plant at Auburn. Herbert Swift, secretary of the Malleable Iron Works, will remain with the new organization.

The foundry occupies the same site upon which it was built in 1863. Edmond R. Swift was the first president and Morris C. Webster was secretary. At the time of the transfer of stock M. C. Swift was president. The foundry is one of the oldest in New England.

Cambria Steel Co. Brings Suit

WASHINGTON, June 8.—The Cambria Steel Co., Johnstown, Pa., has filed suit in the United States Court of Claims to recover from the Navy Department a judgment totaling $236,675.64 claimed to be the balance due on rail shipments of 8846 gross tons made to the navy between March 18, 1918, and Feb. 25, 1919.

In the case of this purchase the Navy Department paid $35 a ton pending an adjustment of the proper price. Secretary of the Navy Daniels later fixed the price at $47 a ton for open-hearth and $45 a ton for Bessemer steel rails which were the prices agreed upon by the Peek Industrial Board. The company cites figures in an attempt to show that the cost per ton plus 10 per cent averaged for the various shipments from $58.69 to $73.95 per ton. The total cost plus 10 per cent is placed at $563,424.42, while the amount paid to the company is $327,150.78, leaving a balance of $236,673.64 due, it is claimed.

Gulf State Steel Additions

BIRMINGHAM, ALA., June 8.—The improvements under way at the mills of the Gulf States Steel Co. are these: 50 per cent addition to the wire drawing capacity, 20 per cent to the nail mill capacity and the installation of turbos to generate sufficient electricity to operate the entire plant electrically. Electric energy is at present supplied where used by the Alabama Power Co.

Steel Mill Proposed

BIRMINGHAM, ALA., June 8.—H. L. Brittain, president of the Birmingham Steel Co., the Mobile Shipbuilding Co., and head of other large interests, and associates, are projecting steel mill and a motor parts works at Rome, Ga. The International Steel & Motors Corporation, capital $20,000,000, is the name of the organization under which it is proposed to operate.

BELGIAN RECOVERY IN STEEL

More Blast Furnaces Starting—58 Per Cent of 1913 Output

(*Special Correspondence*)

BRUSSELS, BELGIUM, May 29.—The iron and steel market continues to be affected by high prices which are preventing numerous transactions. The arrival of supplies of coke from the Ruhr basin, which began on the cessation of the recent troubles in Germany, will permit the starting of a dozen blast furnaces. These very likely will be devoted to turning out Thomas pig in view of the fact that the plants in Belgium need this quality of iron to manufacture or to exchange for semi-manufactured steel. Belgian foundries find themselves in an embarrassing situation, however, because foundry iron is not produced in the kingdom. The usual furnishers in the Grand Duchy of Luxemburg and in Lorraine offer very little, the production of pig iron in those districts having been greatly reduced by shortage of coke or by strikes. This situation, which threatens to become critical, has been the subject of an examination in high quarters, and it is not unlikely that the Minister of Economic Affairs will require producers to furnish a tonnage of pig iron for Belgian consumption.

Besides the 15,000 freight cars and 800 locomotives belonging to the Government which are being repaired in Belgian shops, the railroad equipment industry has a large number of orders for the North of France, where the plants to be reconstructed are many.

The market for rolled products continues firm and the demand is greater than the production, especially in sheets and large flats. Quotations on April 5 were: No. 3 Lorraine pig, 900 francs per metric ton, f.o.b.; Belgian pig, 850 francs; English hematite, 850 francs, c.i.f., Antwerp; merchant iron, 135 francs per 100 kilos; ordinary sheets, 160 francs; rails, 155 francs; beams, 275 francs; iron or steel scrap, 23 to 25 francs; washed coke, 145.50 francs, f.o.b.

Following is a statement of iron and steel production in Belgium for March:

Pig iron, 66,009 tons, or 31.9 per cent of the production in March, 1913.
Finished iron, 14,525 tons, or 57.3 per cent of the production in March, 1913.
Steel ingots and castings, 78,985 tons, or 38.4 per cent of the production in March, 1913.
Finished steel, 90,508 tons, or 58.4 per cent of the production in March, 1913.

Progress is noted in the metallurgical industry. The Usines Metallurgiques du Hainaut at Couillet has all its divisions in normal operation. It is employing more men than in 1914, and producing more than before the war. The Usines Metallurgiques de Sambre et Moselle has relighted a blast furnace of 450 metric tons. Another furnace of a similar type is ready for operation, the company awaiting until the foreign situation clears.

At the Usines de Moncheret at Acoz the reconstruction of the blast furnace has been practically completed. The second blast furnace at Clabecq has been completed and a supply of coke is awaited to begin operating. The steel works and the rolling mills are operating. It is announced that a total of 14 blast furnaces in Belgium are in operation producing an average of 2385 tons per day. They are the following: Thy-le-Chateau, 1; Providence, 1; Societé du Hainaut, 2; Sambre-et-Moselle, 1; Clabecq, 1; Cockerill, 2; Ougree, 2; Angleur, 2; Esperance-Longdoz, 1; Athus-Grivegnee, 1. The Athus-Grivegnee company was one of the concerns most seriously affected by the German invasion. After many difficulties of all sorts it has succeeded in putting into operation a large part of its equipment, notably in the Martin steel plant of the Grivegnee division—four furnaces of 25 tons each. The work of setting up the large sheet rolling mill, the largest in Belgium, is under way.

The Athus-Grivegnee and Ougree-Marihaye companies were attacked recently in the Belgian Chamber of Deputies by a socialist orator, M. Bertrand, who as to Ougree said that it had received from the government as indemnity 1,000,000 francs for damages sustained at the hands of the Germans. The company, he declared, has five collieries which have been operating continuously. Its shares were quoted on the Bourse in 1913 at 1365 francs, while to-day they are at 2155 francs. If the government continued along that line it would need incalculable billions. M. Bertrand took Athus-Grivegnee to task because after the armistice the Belgian recuperation commission found hidden in the company's plant material worth more than 500,000 francs—bolts, bars, rails, pipes, plates, etc. This, he said, was buried in a trench, placed under a mass of dross, and also concealed in a gallery closed by a partition. M. Bertrand said this railroad material had been abandoned by the enemy and belonged to the state. The Germans, he said, certainly had not placed the material where it had been found. Ougree, in replying to the socialist through a letter, said it regretted the orator did not have an opportunity to see the extent of the destruction, which represented 125,927,600 francs without counting other damage, and all that the company wanted was that this material and equipment be replaced.

DUTCH EAST INDIES ACTIVE

Improvement in Japan—Europe Continues to Buy Pig Iron

Cables from Japan tend to be more optimistic. Confidence in the banks is slowly returning, and although concerns in touch with Japanese conditions do not consider there is any great improvement they look forward to better instead of worse conditions. Cancellations and requests to sell on all kinds of material are still being received, one company recently being asked to offer several lots of ingot copper, shipped to Japan from the United States at 22c. per lb. and offered at resale for 19c. per lb., f.a.s., New York.

At present the Dutch East Indies is the most active market of the Far East. Inquiries and orders are being received for steel bars, plates, galvanized sheets, structural steel, machinery and cranes. One exporter has among a number of inquiries from this market one for about 200 tons of steel bars in small sizes and another for 100 tons of plates. Inquiries from India are nearly always accompanied by requests for extended credits.

The demand for foundry iron from Sweden, Holland, Germany and Italy continues. An exporter who has been shipping lots of 500 tons of foundry iron to Rotterdam for trans-shipment into Germany, has 3800 tons booked for this market for July and August and another has recently shipped 200 tons. The greater part of these shipments will probably go to Hamburg. Several small lots of pig iron have been booked for Sweden and an inquiry from Italy calls for about 5000 tons. Billet inquiries have been received from European markets. An export company dealing largely with France has purchased Navy Department ship plates at Philadelphia, Norfolk and Boston navy yards, totaling 6500 tons and has sold for shipment to England 680 tons of large boiler plates.

Inquiries from South American markets show a slight increase in volume, particularly for barbed wire, plain wire and some tin plate. In manufactured lines price is a great obstacle in competition with foreign manufacturers. As an example of this, an American company recently bid $4,300 each, f.a.s., New York, on two 4- to 5-ton electric hoists inquired for by a concern in Antofagasta, Chile. On the same specifications the Chilean company received a bid from an English manufacturer, which considering the exchange rate, was $1,140 each.

Heavy Coal Shipments

UNIONTOWN, Pa., June 7.—Coal shipments through Lock No. 4 at Charleroi, on the Monongahela River, during the month of May established a new high record, 40,145,000 bushels having been locked through. The figure was increased materially as a result of the transportation strike and tie-up, operators shipping by river to the greatest possible extent.

British Iron and Steel Market

Steel Makers Not Quoting for Export—Sheffield Strike Involves 30,000—Pig Iron Scarce

(By Cable)

LONDON, ENGLAND, June 8.

The revision of Cleveland pig iron prices is not now anticipated, but supplies are so scarce that Scotch allocations have been cut down 50 per cent. Hematite pig iron is unaltered and up to 300s. has been paid by neutrals for small lots.

Steel makers are still not quoting for export. The strike at Sheffield now involves 30,000 men, but Dorman, Long & Co., Ltd., have reopened several mills. The tin plate market is easier and 20 x 28's have sold at 145s. for prompt delivery and at 144s. for June. Further sales of oil sizes have been made at 75s. for quarters and 108s. for 10 x 20-in. plates.

We quote per gross ton except when otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.92 for £1, as follows:

	£	s.	£	s.	
Ship plates	26	0 to 34	0		$101.92 to $133.28
Boiler plates	28	10 to 37	0		111.72 to 145.04
Tees	20	10 to 33	0		103.88 to 129.36
Channels	25	15 to 33	5		100.94 to 130.34
Beams	25	10 to 32	0		99.96 to 125.44
Round bars, ¾ to 3 in.	28	0 to 33	10		109.76 to 131.32
Rails, 60 lb. and up	23	0 to 25	0		90.16 to 98.00
Billets	26	10 to 27	10		103.88 to 107.80
Sheet and tin plate bars, Welsh	25	0 to 32	0		98.00 to 125.44
Galvanized sheet, 24 g.	55	0 to 60	0		215.60 to 235.20
Black sheet, 24 g. to 26 g.	50	0 to 54	0		195.00 to 211.68
Tin plate, base box*	3	12 to 3	12	½	14.11 to 14.21
Steel hoops	38	15 to 39	0		151.90 to 152.88
Cleveland basic iron	11	7	½		44.59
West Coast hematite	14	15			57.82
Cleveland No. 3 foundry (export to allies)	10	5			40.18
Ferromanganese	35	0 to 40	0		137.20 to 156.80
Coke	3	2	¾		12.30

*Prompt delivery: for Aug.-Sept., 68s ($13.33.)

Pig Iron Exports Negligible and Prices Higher —Steel Quotations Steadily Rising

LONDON, ENGLAND, May 20.—The recent announcement of an increase in the price of fuel for industrial purposes was at once reflected in the Cleveland pig-iron market. For some time, of course, an advance in pig-iron prices had been expected and therefore it came as no surprise. The rise decided upon amounted to 17s. 6d. on all foundry and forge qualities. So much uncertainty had hung 'round the market, owing to the fact that an advance was imminent the extent of which was unknown, that the announcement came as a relief. Unfortunately, however, this relief would appear likely to be somewhat short-lived, as the revised price is only to hold good for this month, after which it is expected there will be still another revision.

It is pointed out that this year the price of Cleveland pig iron has already risen by about 54s. per ton, which in itself represented the cost of a ton of pig iron in 1914. It is impossible to say whether the apex of prices has yet been reached, more especially in view of the fact that the latest advance is admittedly temporary, while makers say that the increase should really have been greater to cover their increased costs. Prices stand at present at 230s. for No. 1 and 217s. 6d. for No. 3 Cleveland G.M.B. as well as for No. 4 foundry and No. 4 forge. For France, Belgium and Italy, 5s. more per ton is asked.

Export business is negligible, because the iron is almost unobtainable. Exporters, indeed, realize the effect of the new advance, it having already been noticeable that the existing high price was stopping inquiry. This is not surprising when it is realized that for export to overseas markets, other than the three countries named, the price is something in the neighborhood of 300s. per ton. Unfortunately, producers are really unable to give attention to the development of the export trade at present, owing to the pressure of home demand. As far as the latter is concerned, the price has become a secondary consideration to consumers, owing to their anxiety to procure their iron. The prospects of an increased output in the near future are not bright. In hematite prices no change has been made, and East Coast mixed numbers stand at 260s. for the home trade with the usual 5s. premium for export to France, Belgium and Italy. The recent fall in the freights on foreign ore has had the effect of offsetting the increased cost of fuel. Makers have little iron to sell and seem to prefer to clear their existing contracts.

The April production of pig iron amounted to 671,000 tons, of which 246,000 tons was hematite, 226,000 tons basic and the remainder forge, foundry and other qualities, compared with a total of 699,000 tons in March and 645,000 tons in February.

In finished iron and steel, prices have been steadily rising, owing to the increased cost of production. Previous to the rise in coal, some of the North Eastern makers had advanced their home trade prices. Since that time, pig-iron quotations have risen and a further general advance is imminent. Inquiries are not quite so active as they have been but, owing to their well-booked condition, makers do not anticipate any early easing in prices. The shortage of labor in some quarters is serious and, as output is small, deliveries are behind hand. Transport difficulties are a serious factor. In the Midlands, the strike of canal bargemen has caused a complete stoppage of traffic and works are closing down or going on reduced time owing to a shortage of supplies, both of fuel and raw material.

The production of steel ingots and castings in April amounted to 793,000 tons, as compared with 840,000 tons in March and 798,000 tons in February. Inquiry has appeared from Japan for plates for shipbuilding purposes, but difficulty has been found in placing the orders.

It is reported that the Altos Hornos de Malaga is extending its works and building a steel plant with a daily output of 75 tons. The rolling mills are to be reconstructed, probably on a larger scale. In addition, a steel foundry and press are contemplated, as well as the installation of a plant for the recovery of by-products of coal.

Will Build Tube Mill Plant

The Universal Steel Co., Schofield Building, Cleveland, recently organized with a capital stock of $1,500,000, has acquired a site in Huron where it plans to erect a tube mill plant, and will change its name to the Huron Steel Co. The company has engaged Ernest McGeorge, engineer and architect, Cleveland, to prepare plans for the plant. The company at the start will install two mills, one to make butt-weld pipe up to 3-in. and the other to make lap-weld pipe 2 to 4-in. in diameter. Later it intends to install a skelp mill and a merchant mill. The officers of the company are: President, Cromwell Simon; vice-president and general manager, F. W. Mettler, formerly with the Illinois Steel Co., and Wellman-Seaver-Morgan Co.; secretary, R. C. Doan; treasurer, C. E. Doan; assistant general manager, L. H. Cooney, formerly with the Carnegie Steel Co.; production engineer, S. V. Obrad, formerly with American Steel & Wire Co.; superintendent of pipe mills, G. E. Stevenson, formerly with National Tube Co.; superintendent skelp and strip mills, R. H. Ingraham, formerly of the Sharon Steel Hoop Co.

Iron Mill Resumes

After an idleness of two years, the Columbia, Pa., rolling mill of the old Susquehanna Iron Co., recently purchased by the Reading Iron Co., Reading, Pa., has been put in operation for puddling and rolling muckbar iron.

Martin N. Clepper, Columbia, Pa., is superintendent of the plant. More than 250 were employed when the plant opened, but at least 350 men will be employed within the next two months. The Susquehanna rolling mill, recently purchased by the Reading company, will start operation within the next six weeks, extensive renovations now being under way.

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper New York		Tin	Lead		Zinc	
June	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
2	19.00	19.00	51.50	8.65	8.40	8.05	7.70
3	19.00	19.00	50.25	8.70	8.45	8.05	7.70
4	19.00	19.00	49.00	8.75	8.50	7.95	7.60
5	19.00	19.00	....	8.75	8.50	7.97½	7.62½
7	19.00	19.00	48.50	8.75	8.50	8.05	7.70
8	19.00	19.00	49.25	8.75	8.50	8.10	7.75

NEW YORK, June 8.

Although transportation conditions are a little better, they are still chaotic, and as a consequence most of the markets continue to have no definite trend. Demand for copper is light and prices are substantially unchanged. The tin market continues quiet, but prices are considerably lower. The lead market is dull but prices are firm. Buying of zinc is still light, but the market is a little stronger. Antimony is again lower.

New York

Copper.—The only change of interest in the general situation is that leading producers are willing to sell copper at 19c. for delivery through July, instead of June only. In most cases premiums are asked for delivery beyond July, but quotations for last quarter are not heard of. Otherwise the market is without change, the production of copper being decidedly restricted because of the shortage of cars and labor and the effects of the railroad strike. Buying by domestic consumers is still light, but purchases for foreign delivery are fairly good. We quote the market for both Lake and electrolytic copper at 19c., New York, for June and July delivery, with premiums asked for forward positions. In the outside market, so called, small quantities are still available at prices ranging from 18.25c., New York, up, some of this being a limited amount of copper resold by Japanese interests.

Tin.—The market as a whole has been quiet. The only activity to date was on Friday, June 4, when about 325 tons of Straits tin was sold on the New York Metal Exchange, mostly for future shipment. These transactions ranged from 48.50c. to 48.75c. for future shipment, and with 49c. obtained for spot tin on dock. There were small sales also on the first three days of the month of future shipment Straits at prices ranging from 49.62½c. to 50.62½c. Yesterday there was a good inquiry, but very little business, the market closing rather flat at 48.50c., asked by sellers for spot Straits, and 48.25c. for futures. The quotation to-day for spot Straits is 49.25c., New York, the advance being due to higher quotations in London, spot Straits being reported as £280 per ton, an advance of £4 over the quotation yesterday, Monday. A week ago spot Straits in London was quoted at £287 5s. per ton. Arrivals thus far this month were 885 tons, with the quantity afloat 5045 tons. For the month of May deliveries of tin into consumption were 3550 tons and the amount in stock and landing on May 31 was 5356 tons. Imports for the first five months of this year have been 23,013 tons, as compared with 6341 tons on June 1, 1919.

Lead.—Despite the fact that transactions are light the tone of the market is firm and prices are steady. The firmness is due more to short supplies and few sellers rather than good demand. Because of this situation quotations are largely guesswork and nominal, a fair appraisal for early delivery being 8.50c., St. Louis, or 8.75c., New York. The leading interest continues to quote 8.25c., St. Louis, or 8.50c., New York, for early delivery. For spot lead from 9c. to 9.37½c., New York, is the quotation at which levels a fair amount is available; sales were made to-day at 9c. It is true that foreign lead can be reshipped from London and sold in New York at 9c., but it is freely pointed out that the margin of profit is not worth the risk.

Zinc.—A slightly firmer tone has been in evidence the last day or two, but demand is exceedingly light. The improvement noted is due largely to the trend of the London market. Prime Western for delivery in the next two or three months is generally quoted at 7.75c., St. Louis, or 8.10c., New York. Another cause for the slightly better tone is the curtailment of production at various centers, due to labor troubles, lack of fuel and transportation. The car shortage and other railroad difficulties are causes for light buying by consumers.

Antimony.—The market is quiet, with the lower grades quoted at 18.62½c., duty paid, New York, for wholesale lots for early delivery, with 8.75c. asked for the higher grades.

Aluminum.—There is no change in conditions and virgin metal is obtainable from the leading interest at 33c., New York, in wholesale lots for early delivery, with other sellers quoting 31.50c., New York.

Old Metals.—The dull condition of the new metal market is reflected in scrap. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	18.75
Copper, heavy and wire	17.25
Copper, light and bottoms	15.50
Brass, heavy	13.75
Brass, light	9.50
Heavy machine composition	18.00
No. 1 yellow rod brass turnings	11.00
No. 1 red brass or composition turnings	15.50
Lead, heavy	7.75
Lead, tea	6.00
Zinc	5.75

Chicago

JUNE 8.—Copper is dull but unchanged in prices. Tin continues to decline but whereas there was considerable buying in the early stages of the decline, activity has practically ceased. There is some buying in lead but the interest of purchasers is centered on securing deliveries on old contracts. Spelter is quiet but slightly stronger. Antimony is exceedingly dull and has declined to 10c. We quote Lake copper 19.25c. for carloads, tin 51c. to 52c., lead 8.65c., spelter, 7.80c., and antimony, 11c. On old metals we quote copper wires, crucible shapes, 14c.; copper clips, 14.50c.; copper bottoms, 12c.; red brass, 14c.; yellow brass, 10c.; lead pipe, 6.75c.; zinc, 4.50c.; pewter, No. 1, 32.50c.; tinfoil, 35c., and block tin, 42.50c., all these being buying prices for less than carload lots.

St. Louis

June 7.—The non-ferrous markets have been quiet and a little softer, lead closing at 8.50 to 8.75c. and spelter at 8.25c. in car lots. In less than car lots the quotations were: Lead, 9c.; spelter, 8.75c.; tin, 62c.; copper, 20c.; antimony, 11c. All metals were reported in fair supply. In the Joplin district ores were on about the same basis as in the week previous, a little softer if anything with the top figures practically as given a week ago. On miscellaneous scrap metals we quote dealers' buying prices as follows: Zinc, 9c.; heavy yellow brass, 10.50c.; heavy red brass, 15c.; heavy copper and copper wire, 15.50c.; light copper, 13c.; pewter, 35c.; tinfoil, 43c.; zinc, 4.50c.; lead, 6c.; tea lead, 3.50c.; aluminum, 24c.

Water Power Bill Fails

BIRMINGHAM, ALA., June 7.—The Alabama Power Co. awaited only the signature of the President on the water power bill to announce the building of another power dam in Alabama, presumably at Duncan's Rift on the Coosa River, 20 miles below lock 12, where the present power dam is located.

The water power bill, however, although passed by both Houses and the conference report adopted, finally failed of enactment. President Wilson killed it by the "pocket veto" method. He failed to act upon the bill before Congress adjourned sine die, and it therefore failed to become law. Technical objections advanced by the Interior Department were understood to be responsible.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, with revisions effective from Jan. 1, 1920, in carload lots, to points named, per 100 lb., are as follows:

New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23½c.; Indianapolis, 24½c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; all in carloads, minimum 36,000 lb. To Denver the rate is 99c., minimum carload 40,000 lb.; Omaha, 59c., minimum carload 36,000 lb.; New Orleans, 38½c., minimum carload 36,000 lb.; Birmingham, 57½c., minimum carload 36,000 lb. To the Pacific Coast the rate is $1.25 per 100 lb. on articles of iron and steel, minimum carloads 80,000 lb., while the structural steel rate is $1.25, minimum carload 50,000 lb., or $1.315, minimum carload 40,000 lb. The rate on ship plates, Pittsburgh to Pacific Coast, is $1 per 100 lb., minimum carload 80,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 56c., to St. Paul, 49½c.; to Denver, 99c.; to Omaha, 56c., all in carload lots, minimum 46,000 lb. To Jacksonville, Fla., all rail carloads, 41½c., minimum 36,000 lb., less than carloads, 59c.; rail and water, carloads 34½c., minimum 36,000 lb.; less than carloads 46½c. On iron and steel items not noted above, the rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural size, 2.45c. to 4c.

Wire Products

Wire nails, $3.25 to $4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50 and shorter than 1 in., $2. Bright basic wire, $3 to $3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3 to $3.50; galvanized wire, $3.70 to $3.95; galvanized barbed wire and fence staples, $4.10 to $4.45; painted barbed wire, $3.40 to $3.75; polished fence staples, $3.40 to $4.50; cement-coated nails, per count keg, $2.85 to $3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.50 base
Large boiler rivets..... 4.60 base
Small rivets .....50 per cent off list
Small machine bolts, rolled threads,
40, 10 and 5 per cent off list
Same sizes in cut threads.....40 and 5 per cent off list
Longer and larger sizes of machine bolts,
30 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter, rolled threads.40 and 5 per cent off list
Cut threads .....30 and 10 per cent off list
Longer and larger sizes.....30 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 head.....40 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜ in. x 4 in.:
Smaller and shorter.....35 per cent off list
Longer and larger sizes.....25 per cent off list
Hot pressed and cold pressed sq. or hex. blank nuts.2c. off list
Tapped nuts .....$1.75 off list
Semi-finished hex. nuts, U. S. S. and S. A. E.:
⅝-in. and larger.....60 and 5 per cent off list
9/16-in. and smaller.....70 and 5 per cent off list
9/16-in. and smaller, A. L. A. M. or S. A. E.,
70, 10 and 5 per cent off list
Stove bolts in packages.....70 and 10 per cent off list
Stove bolts in bulk.....70, 10 and 2½ per cent off list
Tire bolts .....55 and 10 per cent off list
Track bolts .....6c. base
One cent per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs 25c. extra.
All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52 to $70; chain rods, $75 to $80; screw rivet and bolt rods and other rods of that character, $65 to $70. Prices on high carbon rods are irregular. They range from $75 to $100, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, $4 per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ⅜-in. and 7/16-in., $4.25; 5/16-in., $5; track bolts, $4.90 to $5. Boat and barge spikes, $4.50 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, $3 to $4 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. to 4c. from mill. Common bar iron, 4.50c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, discounts on steel pipe applying as from Jan. 14, 1920, and on iron pipe from Jan. 7, 1920:

Butt Weld

Steel Inches.	Black	Galv.	Iron Inches.	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	1	+25
½	51	36½	⅜	25½	+ 1½
¾ to 3	54	41½	½	29½	11½
			¾ to 1½	34½	18½
			2 and 2½	33½	17½

Lap Weld

2	47	34½	1¼	24½	9½
2½ to 6	50	37½	1½	31½	17½
7 to 12	47	33½	2	28½	14½
13 and 14	37½		2½ to 6	30½	17½
15	35		7 to 12	27½	14½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	¼	+7	+40
½	48	35½	⅜	23½	6½
¾ to 1½	52	39½	½	28½	15½
2 to 3	53	40½	¾ to 1½	34½	19½
			2 and 2½	34½	19½

Lap Weld, extra strong, plain ends

2	45	33½	1½	27½	13½
2½ to 4	48	36½	2	29½	16½
4½ to 6	47	35½	2½ to 4	31½	19½
7 to 8	43	29½	4½ to 6	30½	18½
9 to 12	38	24½	7 to 8	22½	10½
1¼	21½	6½	9 to 12	17½	5½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	1¾ and 1⅞ in.	+20
2½ to 3¼ in.	30½	2 and 2⅛ in.	+10
2¼ in.	24	2½ and 2¾ in.	+1
1¾ to 2 in.	19½	3 and 3¼ in.	— 1½
		3½, 4 and 4½ in.	— 8

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50 to 5.95
Nos. 9 and 10 (base)	3.55 to 6.00
Nos. 11 and 12	3.60 to 6.05
Nos. 13 and 14	3.65 to 6.10
Nos. 15 and 16	3.75 to 6.20

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15 to 6.30
Nos. 22 to 24	4.20 to 6.35
Nos. 25 and 26	4.25 to 6.40
No. 27	4.30 to 6.45
No. 28 (base)	4.35 to 6.50
No. 29	4.45 to 6.60
No. 30	4.55 to 6.70

Galvanized Black Sheet Gage—Bessemer

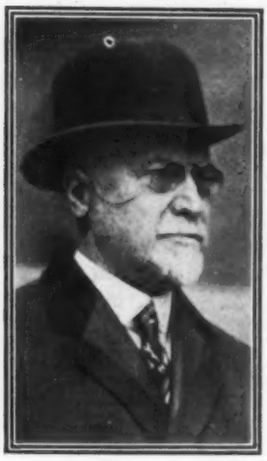
Nos. 10 and 11	4.70 to 7.50
Nos. 12 to 14	4.80 to 7.60
Nos. 15 and 16	4.95 to 7.75
Nos. 17 to 21	5.10 to 7.90
Nos. 22 to 24	5.25 to 8.05
Nos. 25 and 26	5.40 to 8.20
No. 27	5.55 to 8.35
No. 28 (base)	5.70 to 8.50
No. 29	5.95 to 8.75
No. 30	6.20 to 9.00

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15 to 6.15
Nos. 17 to 21	4.20 to 6.20
Nos. 22 to 24	4.25 to 6.25
Nos. 25 to 27	4.30 to 6.30
No. 28 (base)	4.35 to 6.35
No. 29	4.40 to 6.40
No. 30	4.40 to 6.40
Nos. 30½ and 31	4.45 to 6.45

PERSONAL

Hon. James T. McCleary recently resigned as secretary of the American Iron and Steel Institute on account of ill health and the directors have accepted the resignation and declared the position vacant. Howard H. Cook, assistant secretary, will discharge the duties of secretary until it is decided whether a successor to Mr. McCleary will be elected. Mr. McCleary was born in Ingersoll, Ontario, Feb. 5, 1853, and graduated from McGill University, Montreal. He was superintendent of schools for Pierce County, Wisconsin, and in 1881 became professor of history and civics in the State Normal School at Mankato, Minn., continuing in that position until 1892, when he was elected to Congress from the second Minnesota district. He served from 1893 to 1907, and in March, 1907, was appointed Assistant Postmaster General by President Roosevelt. He was elected secretary of the American Iron and Steel Institute, Jan. 11, 1911. Mr. McCleary will take an extended vacation at his summer home in Wisconsin. He leaves the institute with the best wishes of all of the members for his speedy restoration to health.



JAMES T. MCCLEARY

George P. Spear has been appointed general manager of the Corbin Screw Corporation, New Britain, Conn., succeeding Charles Glover, who has been actively identified with that company for more than 40 years. Mr. Spear has reorganized the sales department, appointing Ernest E. Baldwin as general sales manager to succeed the late William E. Diehl.

Henry Clay Graton, treasurer Graton & Knight Mfg. Co., Worcester, Mass., is attending to business again after having been confined to his home by an injury received about two months ago.

Glenn L. Orr was elected secretary, treasurer and general manager of the Lansing Foundry Co., Lansing, Mich., and assumed his new duties June 1. He has been connected with the Detroit Engine Works, Hupp Motor Corporation, Packard Motor Car Co. and the Briscoe Motor Co., Jackson, Mich.

Remsen B. Cole, 504 Colonial Building, New Haven, Conn., has been appointed exclusive Connecticut representative of the Falcon Steel Co., Niles, Ohio. He will represent the company on the sale of black, blue-annealed and galvanized steel sheets.

V. B. Chamberlain has been made manager of sales and production, steel department, Stanley Works, New Britain, Conn. R. C. Germond succeeds Mr. Chamberlain as superintendent of departments Nos. 100 and 200.

Col. E. H. Williams has recently become identified with the Valley Mold & Iron Corporation, Sharpesville, Pa., as manager of service and inspection departments, with which will be connected considerable research work. Colonel Williams recently resigned from the Army, his last duties having been as a member of the general staff at Washington. He entered the Army as a private about two and a half years ago and was one of two civilians to attain this unusual honor.

H. A. Tibbits, formerly with the New York office of E. B. Leaf Co., is now with M. Isecovitz & Co., iron and steel scrap, Reading, Pa.

John A. Sutton, formerly a vice-president Crucible Steel Co. of America, and Geo. W. Sargent, formerly metallurgist, have retired. M. A. Green, formerly superintendent of agencies, has resigned, and has been succeeded by W. D. Wintersmith, assistant general sales agent, who will fill the duties of both offices. N. W. Nolen, formerly comptroller of the company, has also resigned, and has been succeeded by D. C. Barry.

Judge Gary expects to sail for Europe next month. He has not crossed the Atlantic since 1914, when he was in France at the time of the outbreak of the World War and rendered valuable service to Americans who were in Paris.

Victor Mayper, 15 East Fortieth Street, New York, has associated himself with the firm of Arthur M. Loeb & Co., Lima, Peru, and Panama, R. P., and will act as purchasing agent for this firm. The firm's business is principally the buying and selling of machinery and miscellaneous steel products.

Frank L. Platt, formerly retained by the War Department as a specialist on industrial planning projects, and late first lieutenant 24th Engineers, A. E. F., has returned to civil life, and has become associated with the firm of Waldron & Van Winkle, New York and Boston. Mr. Platt will be in the New York office at 37 Wall Street.

Ivar Du Rietz, Sven Du Rietz & Co., Inc., Stockholm and Norrkoping, Sweden, has been in the United States for the past month and a half and is returning to Sweden after visiting the various manufacturers whom they represent in that territory. Mr. Du Rietz states that he believes the American manufacturer should take Sweden in as a co-partner in the large amount of business that is to be developed with Russia and the new Baltic States. Sven Du Rietz & Co. have opened an office in 1702 Consumers' Building, Chicago, in charge of Walter E. Devlin.

H. G. Weidenthal, formerly vice-president the James H. Herron Co., consulting engineer, Cleveland, has opened an office of his own at 458 Hippodrome Annex, 715 Prospect Avenue, Cleveland.

Thomas F. Roop, formerly with the Joseph Joseph & Brothers Co. for several years as manager of its yards in Norfolk, Va., Chicago Heights, Ill., and Coatesville, Pa., has severed that connection and is now with H. T. Henning & Co., engaged in a general iron and steel business, with offices in the Shubert Building, 250 South Broad Street, Philadelphia.

Maj. B. H. Butler and C. E. Davis, engineers from Kirkstall Forge, Ltd., Leeds, England, were visitors in Pittsburgh last week, and while there inspected several plants of the Carnegie Steel Co. and other concerns. They stated that it was the intention to make some large additions and improvements to their plant at Leeds, England, and they are visiting this country for the purpose of getting ideas.

The Phoenix Iron Co. and the Phoenix Bridge Co. announce that J. H. Rowland, formerly of the Phoenixville staff, is appointed resident manager succeeding D. W. Sisson, deceased, and with Walter E. Fentzke, assistant manager, is now in charge of the new offices, 132 Nassau Street, New York.

H. H. Edge has been succeeded as works manager of the Locomobile Co., Bridgeport, Conn., by E. L. Larson, formerly with the Detroit Pressed Steel Co., Detroit.

W. T. Chollar has been appointed district manager of the Lakewood Engineering Co., New York office, to succeed George S. Hedge, who has retired from active business.

William H. Kent has resigned as plant engineer of the Pittsburgh Crucible Co., works at Midland, Pa. Mr. Kent has not as yet made known his plans.

At a meeting of the board of directors of the Pulaski Iron Co., Pulaski, Va., on May 24, the following appointments were made: Isaac T. Mann, chairman of the board; Percival Johnson, president, with office at Phil-

adelphia; James Ellwood Jones, vice-president; Hugh R. Hawthorne, secretary; M. E. Bowman, treasurer; Harry C. Greifzu, assistant secretary, assistant treasurer; Arthur Bleakley, assistant secretary, assistant treasurer.

At the annual meeting of the sales department, Phoenix Iron Co., Philadelphia, June 3, a presentation was made to A. H. Cordery, general manager of sales, by the sales department. Mr. Cordery has been connected with the company 51 years.

Dudley R. Kennedy, formerly counselor on labor, employment and industrial relations problems, Philadelphia, has joined the Cluett-Peabody Co., Troy, N. Y., as an executive in production work.

John D. Caldwell has been appointed district manager of sales for the Brier Hill Steel Co., Youngstown, Ohio, in the Chicago territory, succeeding to the position vacated by the death of Joseph A. Rees. Mr. Caldwell had been assistant to Mr. Rees for a number of years.

A number of friends of Joseph G. Butler, Jr., vice-president Brier Hill Steel Co., Youngstown, Ohio, have presented the Butler Art Institute a life-size portrait painting of Mr. Butler by Ivan G. Olinsky. The institute is Mr. Butler's gift to the people of the Mahoning Valley.

R. R. Hoefer, who has represented the Heald Machine Co., Worcester, Mass., in the New York territory for the past few years, has resigned to join the machinery department of the Cleveland Tool & Supply Co., Cleveland, on June 15.

P. Merril has been appointed general manager of the Dominion Iron & Steel Co. and the Dominion Coal Co., Sydney, N. S. He will reside in Sydney and will be in full charge of the operations of the two corporations and their subsidiaries.

G. E. Swartz, mechanical superintendent Torbensen Axle Co., Cleveland, has resigned to become the manufacturing manager of the Timkin-Detroit Axle Co.

W. C. Buell, Jr., formerly engineer of tests and later chief engineer of Tate-Jones & Co., Inc., on June 1 became associated with the George J. Hagan Co., Pittsburgh, furnace and combustion engineers, as chief engineer of their newly organized liquid fuel department.

Elbert Rogers, formerly purchasing agent Wickwire Steel Co., Buffalo, has been made purchasing agent of the Wickwire-Spencer Steel Corporation, with headquarters at Buffalo, to succeed Albert C. Lorion, resigned. Charles H. Sparrell is assistant purchasing agent, with headquarters at Worcester, Mass. Mr. Sparrell formerly was purchasing agent for the Spencer Wire Co., Worcester. George B. Cunningham, formerly with the Wright Wire Co., Worcester, and Frank J. Ekengren, Millbury, Mass., will assist Mr. Sparrell. Mr. Ekengren for a number of years was connected with the American Steel & Wire Co., Worcester.

Charles L. Jamison, secretary A. M. Byers Co., Inc., Pittsburgh, made an address recently before the Association of Reserve City Bankers, held in Cleveland, on the subject of "Technical Credits."

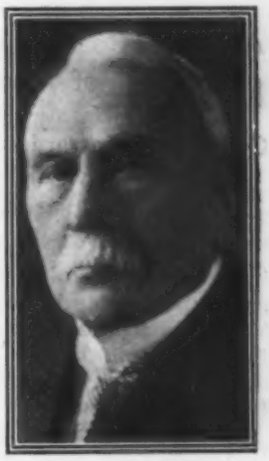
At a meeting of the board of directors of the Pierce-Arrow Motor Car Co., Buffalo, on June 3, Col. Charles C. Clifton was re-elected chairman of the board of directors. Col. George W. Mixter, vice-president and general manager, was elected president and John C. Jay, Jr., formerly president, elected chairman of the executive committee. Mr. Jay and Colonel Mixter are members of George W. Goethals & Co.

W. H. Hunter, for the past eight years Boston representative of the Republic Iron & Steel Co., has resigned, effective July 1, to become associated with the Boston and New York banking firm of Richardson, Hill & Co.

Thomas S. Quinn, president of the Lebanon Steel Foundry Co., Lebanon, Pa., and his wife, sailed from New York, recently, for a tour of Europe.

OBITUARY

JOHN ILLINGWORTH, one of the veteran steel manufacturers of the United States, president John Illingworth Steel Co., Frankford, Philadelphia, died Sunday, June 6, at his home, 58 Park Place, Newark, N. J., where he had lived with his family for almost half a century. The end came after an illness of six months. Falling asleep about 3 o'clock, Sunday afternoon, he died without regaining consciousness. He was 85 years old. The immediate cause of death was uremia, although he had also been a sufferer from rheumatism.



JOHN ILLINGWORTH

Mr. Illingworth was born in Yorkshire, England, in 1836. His father, Robert Illingworth, was a farmer. The early part of Mr. Illingworth's life was spent on his father's farm. He attended the local school a part of each year until he was 13 years old, when he was put to work. He left home in 1855 and came to America. In Jersey City he found work with the Adirondack Steel Co., then producing crucible steel. His elder brother, Benjamin, who had learned the steel manufacturing trade in England, and who came to this country in 1848, was manager of the hammer department of the Jersey City company. In 1864 Mr. Illingworth became a member of the firm of Prentice, Atha & Co., and at the end of 20 years the name was changed to Atha & Illingworth. The firm's steel plant was at Harrison, N. J., on what is now the site of the works of the Crucible Steel Co. of America.

When the plant passed to the Crucible Steel Co. of America in 1905, Mr. Illingworth, with his two sons, Clarence and William H., and Charles P. Soden, established a steel plant at Frankford, Pa.

Mr. Illingworth was the inventor of several devices, including a machine for casting skate steel, by which hard steel and soft steel were cast in combination, the lower side of the skate being hard and the upper soft. In 1882 he invented roll disks for rounding and polishing steel; in 1892 a machine to prevent "piping" in the casting of steel ingots.

In 1870 Mr. Illingworth was married to Madeline V. Williams. Mrs. Illingworth died of heart disease Jan. 28, 1913. Two sons, Clarence Illingworth, of Philadelphia, and William H. Illingworth, of Newark, and one daughter, Mrs. H. F. Corry, of Newark, survive.

THOMAS F. MURPHY, Pittsburgh representative Stark Rolling Mill Co., Canton, Ohio, died at his home at Coraopolis, Pa., Thursday, May 27. Death was caused by blood poisoning resulting from an injury to his hand.

D. B. KIRK, vice-president C. & G. Cooper Co., Mount Vernon, Ohio, died May 24, aged 74 years.

CHARLES ETHAN BILLINGS, hardware manufacturer and inventor, who founded the firm of Billings & Spencer, Hartford, Conn., in 1869, died at his home there at the age of 83. The son of a Vermont blacksmith, he became one of the largest makers of hardware and machinery in the United States, and the inventor of valuable articles now in general use, such as drills, chucks, pocket knives, wrenches. He was a former president of the American Society of Mechanical Engineers and a member of its honorary council.

The Riverside Boiler Works, Inc., Cambridge, Mass., is operating at about 50 per cent of capacity owing to the scarcity of raw materials. The corporation has but two weeks' supply of sheets on hand.

Machinery Markets and News of the Works

RAILROADS BUYING

Atlantic Coast Line Largest Purchaser of Machine Tools

Orders for Upwards of $500,000 Worth of Shop Equipment Placed—Buying in Other Industries at Low Point

Though new railroad buying has become a more important factor in the machine-tool trade, the shrinkage in purchasing by other industries is more marked. The automobile trade is no longer a factor, revision of its production schedules due to the difficulty in getting shipments of raw materials having checked plans for further expansion.

In railroad buying, the most conspicuous order was that placed last week by the Atlantic Coast Line for upwards of $500,000 worth of shop equipment, the bulk of the business going to one company. The Chicago, Burlington & Quincy has distributed orders totaling about $200,000 at Chicago, while other roads have bought smaller quantities of tools at Cincinnati, Cleveland and in the East. The Hocking Valley, Big Four, New York Central and Long Island roads have been among the purchasers of small lots of tools. Action is expected shortly on the Norfolk & Western and Chesapeake & Ohio lists, recently issued. Inquiry for large lots of tools is expected from the New York Central, Erie and Delaware, Lackawanna & Western.

Shipping conditions have not materially improved, though they are not so unsatisfactory as a few weeks ago. Many shipments, however, are greatly delayed, frequently from 30 to 60 days beyond the time originally specified. Cancellations have resulted in some instances because of failure of builders to make delivery on time. The chief concern of some large dealers is to make shipments of their accumulated orders rather than to load up with additional business.

A good many manufacturers have stated that they are definitely out of the market and whatever plans they had for expansion are being held in abeyance. There are some exceptions to this, however, notably the General Electric Co. Though this company is reported to have curtailed its appropriations for shop equipment, it continues to inquire, its latest list calling for 30 tools, mostly milling machines.

The expectation of lower prices one large buyer assigns as the reason for cutting down its buying. If lower prices are coming, there is no evidence of it at present. On the contrary, advances are still being announced, the latest being a rise of 15 per cent on some makes of planers, and a maker of turret lathes announces a 10 per cent advance, effective Aug. 1.

New York

NEW YORK, June 8.

Except for new railroad buying, the past week has been devoid of interesting developments in the machine-tool market. The Atlantic Coast Line bought about $500,000 worth of shop equipment from the Niles-Bement-Pond Co., almost the entire order, upward of 100 machines, going to that company. Plate shop machines have been bought or will be bought from another manufacturer. The total purchases will probably reach $600,000 or more. A significant feature of this buying was the haste with which it was put through. The inquiry was issued about June 2, the appropriations were provided by the railroad directors on June 4, and the order was placed on June 9, only about two days after the quotations were received. There has been other railroad buying in the East, but nothing so conspicuous. The Long Island Railroad and the New York Central have each purchased a few machines. The trade is awaiting lists from the New York Central, Erie and Delaware, Lackawanna & Western. The Delaware & Hudson is contemplating the purchase of new equipment for its shops at Watervliet, N. Y., where a new superintendent of motive power has recently been installed. The American Locomotive Co., New York, has inquired for two or three tools and the Baldwin Locomotive Works, Philadelphia, is in the market for repair equipment, especially flue machines.

Among manufacturers there is little activity, so far as buying is concerned. A good many manufacturers in the East, it is known, have now definitely decided to make no further purchases of shop equipment, except actual necessities. It is reported that the General Electric Co., which has been one of the largest purchasers of machine tools in recent months, has considerably curtailed its appropriations, yet a new list has been issued by this company calling for about 30 tools as follows: 14 vertical milling machines, equivalent of No. 3 Cincinnati; five plain horizontal milling machines, similar to No. 3 Cincinnati; eight special dovetail milling machines, equivalent to Newton; five two-spindle slab millers; two punch presses, equivalent to No. 5 Niagara; one ⅛-in. tool room lathe.

Dullness continues in the crane market, with the exception of hand power cranes and electric hoists, for which inquiry is fairly active. The Baldwin Locomotive Works is in the market for 18 overhead traveling cranes of small capacity for Eddystone, Pa. The American Locomotive Co. is in the market for about eight electric hoists for Chester, Pa., and the J. G. White Engineering Co. is inquiring for a 5-ton, 26-ft. 6-in. span overhead traveling crane for the Nichols Copper Co., Laurel Hill, Long Island.

Recent sales include: The Milwaukee Electric Crane & Mfg. Co., a 5-ton, 28-ft. span overhead traveling crane to the Staten Island Shipbuilding Co., Port Richmond, N. Y.; the Champion Engineering Co., an 18-ton, 29-ft. 8-in. span overhead traveling crane to the New York Central Railroad for Harmon, N. Y.; the Shepard Electric Crane & Hoist Co., a 5-ton, 50-ft. span crane to the National Cast Iron Pipe Co., Dolceto Junction, Ala.; a 5-ton, 52-ft. span crane to the Draycott Mills, Inc., Fulton N. Y.; a 3-ton, 32-ft. span crane to the Bibb Mfg. Co., Porterdale, Ga.; a 5-ton, 59-ft. span crane to Automobiles Berliét, Paris, France, and four 15-ton monorail hoists to the Cuban-American Sugar Co. for export.

The Holmes Mfg. Co., Shelton, Conn., which some time ago purchased considerable equipment for the manufacture of the Cameron automobile engine, is buying a few more tools to round out and will be in production soon. Additional equipment will be bought later.

The Brooks-Ostruk Co., 225 West Sixty-sixth Street, New York, which will soon occupy the plant in Newark, N. J., formerly occupied by J. M. Quinby & Co., buggy manufacturers, is purchasing presses for the manufacture of automobile bodies.

The Simms Magneto Co., East Orange, N. J., which has done considerable purchasing of new and second-hand tools in the last few months, is in the market for nine external grinders.

The Remington Typewriter Co., 374 Broadway, New York, has awarded contract to the Hunt-Dodge Co., 405 Lexington Avenue, for extensions and improvements in its plant at Flushing, L. I., to cost about $25,000. This works formerly was the property of the Nathan Mfg. Co., manufacturer of lubricating devices, and was acquired by the Remington Co., with possession taken in May. The plant comprises four main buildings, with floor area aggregating about 200,000 sq. ft.

The Tubal Corporation, New York, has been incorporated with a capital stock of $50,000 by M. P. Joffe, A. McGall and A. E. Ewald, 333 West Forty-sixth Street, to manufacture metal sharpening devices, etc.

The Sheet Metal Mfg. Co., 949 Myrtle Avenue, Brooklyn, has increased its capital stock from $50,000 to $100,000.

Voland & Sons, Inc., New Rochelle, N. Y., has been incorporated with a capital stock of $100,000 by F. H. Seacord, E. L. and G. G. Voland, to manufacture balances, weights, etc.

The Perfect Body Co., 315 West Forty-seventh Street,

New York, manufacturer of automobile bodies, has filed dissolution of its New York charter to incorporate under Delaware laws, with capital stock of $150,000. E. T. Shaw, 347 Madison Avenue, is representative.

The Albany Embossing Co., 20 Pruyn Street, Albany, N. Y., has awarded contract to Feeney & Sheehan, 164 Montgomery Street, for an addition to its plant on Liberty Street, to cost about $100,000.

The Skootamota Co. of America, New York, has been incorporated with a capital stock of $100,000 by J. J. Glynn, F. J. Coyle and L. Halle, 120 Broadway, to manufacture automobile motors.

The Edward Ermold Co., 652 Hudson Street, New York, manufacturer of machinery, has increased its capital stock from $50,000 to $250,000.

The Hopewell Insulation & Mfg. Co., 555 Eastern Parkway, Brooklyn, is planning for the purchase of a number of machine tools.

The A. G. Richter Iron Works, New York, specializing in structural steel and ornamental iron work, has removed its plant from 316 Avenue A to 409-15 East Twenty-second Street, where increased operating facilities are provided.

The Standard Steel Products Corporation, New York, has been incorporated with a capital stock of $100,000 by J. T. Meeker, G. W. Beadle and F. H. White, 336 Park Place, Brooklyn, to manufacture iron and steel products.

The Marlin-Rockwell Corporation, 347 Madison Avenue, New York, will hold a special meeting June 18 to arrange for the sale of certain divisions of the company, including the radiator division, with machinery and equipment now in use; asbestos division, embracing all of the so-called Heany projects, with machinery and equipment, together with the plant on Willow Street, New Haven, Conn.; and the sporting goods division, including all business relating to the manufacture of firearms. Ralph A. Gamble is secretary.

The Radio Corporation of America, Woolworth Building, New York, has completed plans for the erection of a new wireless station at Rocky Point, L. I. The work will comprise a large central power house, with 72 self-supporting steel towers, 400 ft. high, with auxiliary equipment. The project is estimated to cost in excess of $5,000,000.

The General Electric Co., Schenectady, N. Y., has plans under way for an addition to cost about $40,000.

Konig Brothers & Co., 82 Beaver Street, New York, will purchase a number of machine tools, including radial drills, planer, etc., for use in connection with sugar mill operation in Cuba.

The Metropolitan Engraving Co., 1250 Atlantic Avenue, Brooklyn, has had plans prepared for a new one-story metal-working shop, 62 x 100 ft., at 1262 Atlantic Avenue, to cost about $20,000.

Fire, May 27, damaged one of the buildings at the plant of R. Hoe & Co., Grand, Delancey and Columbia streets, New York, manufacturers of printing presses and machinery, with loss estimated at $25,000.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, has arranged for a preferred stock issue to total $10,000,000. A special meeting for ratification has been called for July 1.

The Manning Abrasive Co., Troy, N. Y., manufacturer of abrasive products, grinding wheels, etc., has increased its capital from $300,000 to $1,000,000.

The Best Electric Corporation, New York, has been incorporated with an active capital stock of $25,500 by G. Frankel, H. Hyman and J. J. Lazarce, 10 Wall Street, to manufacture electric specialties and metal novelties.

The American Instrument & Tool Co., 435 East 102d Street, New York, has filed notice of dissolution.

The Aerial Service Co., Hammondsport, N. Y., has been organized by W. C. Chadeayne and A. K. Ainlay, Hammondsport, to manufacture aircraft and parts.

The Safety Fender Co., Brooklyn, has been incorporated with a capital stock of $25,000 by H. A. Weinstein, V. E. Silverman and H. Berger, 1924 Fulton Street, to manufacture iron fenders, etc.

The Cook Sure Fire Commutator Co., Brooklyn, has been incorporated with a capital stock of $60,000 by J. Gaydica, F. C. Spinner and G. E. Cook, 45 Tehama Street, to manufacture electrical specialties.

The Perwin Corporation, Freeport, L. I., has been incorporated in Delaware with capital stock of $12,500,000 by William F. Cornell, Freeport; Frank F. Lapp and George McFadden, New York, to manufacture electrical and pneumatic equipment and devices.

Considerable mechanical and electrical equipment will be installed in the two-story addition to the plant of the Arrowhead Paper Mills Co., Battle Island, Fulton, N. Y., 160 x 200 ft., and estimated to cost $200,000.

The High Tension Transformer & Equipment Co., 80 Washington Street, Hoboken, N. J., has been incorporated with a capital stock of $60,000 by Martin S. Cohn and Harry J. Sandheim, to manufacture electrical products.

The Simmons Co., Brunswick Avenue, Elizabeth, N. J., manufacturer of brass and iron beds, springs, etc., with headquarters at Kenosha, Wis., has increased its capital stock from $40,000,000 to $125,000,000.

The Empire Cream Separator Co., Willow Street, Bloomfield, N. J., manufacturer of cream seperators, has filed plans for an addition to cost about $40,000.

The American La France Fire Engine Co., Elmira, N. Y., has awarded all miscellaneous contracts for the erection and completion of its new plant on North Arlington Avenue, Bloomfield, N. J., for the manufacture of motor trucks. The works will cost about $300,000, including equipment.

The Flower Waste & Packing Co., Oak Street, Bayonne, N. J., is planning to rebuild its plant destroyed by fire May 26, with loss estimated in excess of $50,000. Colonel L. F. Donohue is head of the company.

The Central Railroad of New Jersey, 143 Liberty Street, New York, has been granted permission to issue notes for $5,775,000, the proceeds to be used for equipment purchases.

The Mineral Products Corporation, Newark, N. J., has been incorporated with a capital stock of $100,000 by George W. Freligh, George H. Winkler and Howard F. Kirk, to operate a metal reclaiming plant.

F. C. Mesa, Chancellor Avenue, Irvington, N. J., manufacturer of ammunition, is having plans prepared for a one-story addition, 100 x 120 ft. A power plant will also be erected.

The Hanson & Van Winkle Co., 269 Oliver Street, Newark, manufacturer of dynamos, motors, parts, etc., has filed plans for extensions and improvements in its plant to cost about $14,500.

The International Gas Recorder Mfg. Co., Newark, has been incorporated with a capital stock of $1,000,000 by Edward A. Gitt and Frederick C. Fisher, Newark, and Frederick Evans, Summit, to manufacture gas measuring and recording apparatus.

The Bretscher Mfg. Corporation, Newark, recently incorporated with a capital stock of $100,000 to manufacture metal specialties, metalware, etc., has leased a portion of the building at 70-72 Marshall Street for its proposed new plant. Hans Bretscher and Rudolph Burkart head the company.

Richard J. Krantheim, 67 South Ninth Street, Newark, has filed notice of organization to manufacture tools, dies, etc. Richard J. and Oscar Krantheim head the company.

Fire, May 29, destroyed a portion of the plant of the Riverside Steel Casting Co., Passaic Avenue, Kearny, N. J., with loss reported in excess of $30,000.

David Almond, Inc., 88 Warren Street, Newark, manufacturer of special machinery, is having plans prepared for a new two-story plant, 40 x 80 ft., on Fifth Street, between Fourth and Park avenues, to cost about $15,000. The company has property 100 x 100 ft. at this location to provide for expansion.

The former plant of the Acme Brass Foundry Co., 60 Elm Street, Newark, erected about three years ago, has been acquired by Louis Weitz, Paterson, N. J., head of a new company which will manufacture brass and bronze castings. The property comprises a one-story building, occupying the entire site, 50 x 110 ft. Considerable equipment installed at the plant and previously used by the Acme company has also been purchased. The new owner will inaugurate operations at an early date.

In connection with its new service building to be erected at 957-63 Broad Street, Newark, the Chevrolet Motor Co., now at 309 Central Avenue, will establish a complete machine shop, 100 x 150 ft., to handle all features of parts manufacture and repair work. The entire structure is estimated to cost about $250,000.

The Ornamental & Architectural Iron Works, 437 Grove Street, Jersey City, N. J., has filed notice of organization to manufacture iron and steel specialties. Morris Victorsohn heads the company.

The Eastwood Wire Mfg. Co., Joralemon Street, Belleville, N. J., manufacturer of brass wire cloth, steam fittings, etc., has increased its capital stock from $250,000 to $1,000,000.

The James A. Wilson Mfg. Co., Garwood, N. J., has been incorporated with a capital stock of $20,000 by James A. Wilson, C. F. Christian and A. C. Whyte, to manufacture iron and steel products.

The Passaic Rubber Co., 625 Main Street, Passaic, N. J., has been incorporated, with a capital stock of $100,000, by Henry C. Mathey and James W. Partington, to manufacture rubber specialties.

The Interboro Steel Works, New York, has been incorporated with a capital stock of $50,000 by R. Blumstein, A. J. Halpin and H. E. Schiff, 41 Park Row, to manufacture iron and steel products.

The Sopwith Aeroplane Corporation of America, New York, has been incorporated with a capital stock of $50,000 by J. and A. McKittrick, and J. W. Bishop, 30 East Sixty-first Street, to manufacture airplanes and parts.

The Midvale Products Corporation, New York, has been incorporated with a capital stock of $20,000 by M. and B. Neifeld, and M. H. Fischer, 241 West Seventy-sixth Street, to manufacture iron and steel products.

The Universal Fire & Burglar Alarm Co., New York, has been incorporated with a capital of $50,000 by H. Hubert, J. A. Bolles and C. O. Winne, 443 Fifty-first Street, Brooklyn, to manufacture electric-operated fire and burglar alarm systems.

The Ever-Hot Heater Corporation, New York, has been incorporated with an active capital stock of $750,000 by A. Ryder, M. Robinson and R. C. Moore, 220 West Forty-second Street, to manufacture heaters.

The Bates Mfg. Co., 50 Church Street, New York, manufacturer of numbering machines, has increased its capital stock to $50,000.

The American Auto Fender Works, Brooklyn, has been incorparted with a capital stock of $15,000 by R. and I. Rosenthal, 715 Lafayette Street, to manufacture automobile fenders and other sheet metal specialties.

The Ohio State Rubber Tire Co., New York, has been incorporated with a capital stock of $100,000 by R. L. Delisser, E. O. Machlin and R. S. Ireland, 680 St. Nicholas Avenue, to manufacture automobile tires.

The Clifford Brass & Copper Co., New York, has been incorporated with a capital of $50,000 by H. and H. S. Sack, and M. I. Rappaport, 365 Myrtle Avenue, Brooklyn, to manufacture brass, copper and other metal products.

The Silo Silver Mfg. Co., New York, has been formed by a consolidation of the E. & S. Silver Plating Co., and the Silo-Metal Spinning Co. S. Wolis and N. Shanks, 5 Beekman Street, head the company.

New England

BOSTON, June 7.

Machine tool prospects in this district have grown noticably smaller since June 1, but the market is by no means at a standstill. The Amoskeag Mfg. Co., Boston, which a fortnight ago issued a large list, has not bought one tool against it; the United Shoe Machinery Co., Beverly, Mass.; stopped buying after completeing about half its list, and other leading interests, who were considered likely prospects have proven equally disappointing. No weakening of prices has accompanied the falling off in business, however. On the contrary, one line of planers was advanced about 10 per cent June 1, and indications strongly point to higher quotations on a line of lathes in the near future. An encouraging feature is that no cancellations have been received.

Compared with reports received from other sections of the country New England business appears to be holding out well. The Providence Engineering Co., Providence, R. I., has issued at list covering several radial drills, lathes, grinders, etc.; the Draper Corporation, Hopedale, Mass., has a list out for upright and sensitive drills, from 22 in. to 30 in., and involving about 150 spindles, and the Mead-Morrison Mfg. Co., East Boston, hoisting machinery, which recently bought about $60,000 worth of production equipment, some of which has been delivered, has issued a large list for tool room equipment. Contrary to a rumor, it will not sell a part of its plant, but is contemplating selling some equipment bought during the war for special work. The company is building a plant on its property which will be leased to a metal stamping concern.

The Newport Torpedo Station, Newport, R. I., has made further purchases, including four lathes, 24-in. planer, sensitive drill, electric tools and other equipment, some for the manufacture of shells, and the rest for the training school. It has other tools under consideration and is expected to close within a week. The Sullivan Machinery Co., Clairmont, N. H., has made further contracts for medium heavy duty tools; the United Shoe Machinery Co., bought six planers and is inquiring for about as many more, and the Boston Gear Works, Norfolk Downs, Quincy, Mass., has taken another thread miller. The Saco-Lowell Shops, Boston, are in the market for considerable machine shop equipment for the new Biddeford, Me., plant. The Noyes-Buick Co., Boston, has purchased a complete line of motor-driven tools for its new Commonwealth Avenue service station.

The New Departure Mfg. Co., Bristol, Conn., is negotiating for approximately 40 air chucks.

In the used tool market, the Chapman Mfg. Co., Winchester, Mass., bought five Gridley tools from the Boston Ordnance Department, which also sold four Toledo presses to New England and Indiana companies, and a convertible press to the Murphy Die & Machine Co., Boston. At the auction sale of the Wellington Avenue plant of the Framingham Screw Works, Framingham, Mass., the equipment brought about $22,000. At the auction of the Maxim Corporation plant, Derby, Conn., 874 lots of machine tools and machinery and mechanical equipment brought $54,884, and 153 lots at the sale of the Gran-Hammond Mfg. Corporation, New Haven, Conn., brought $10,720.

The Amoskeag Mfg. Co., Boston, is about to close for a 60-ton crane. The General Electric Co., West Lynn, Mass., and Stone & Webster, Boston, have not covered their crane requirements as yet. Prices on one lot of cranes offered in this market have been withdrawn. The Palmer Foundry, Palmer, Mass., is about to close on a 5-ton Shepard electric crane.

The Ordnance Department, Boston, is well sold out on machine tools, but still has about 25 Gridley tools, two Cone automatics and seven multiple drills.

The plant of the Maxim Corporation, Derby, Conn., was recently sold at auction to Mr. Holmes, of the Holmes Mfg. Co., Shelton, Conn., who in turn sold it to New Haven interests for investment.

The Grant-Hammond Mfg. Corporation's plant, New Haven, Conn., has been sold by auction to the Blakeslee Drop Forging Co., Plantsville, Conn., for $62,500, and hereafter will be known as plant B of that organization. It will be used for drop forgings. The Blakeslee Drop Forging Co. has been operating the plant for the receivers since last August.

The Campbell Mfg. Co., Worcester, Mass., spinning machine rollers, etc., has bought a plant in Barre Plains, Mass., which has been idle for some time and will equip it for the manufacture of rollers.

Work on the three-story, 32 x 114 ft. addition to the J. N. LaPointe plant, New London, Conn., is progressing.

The contract for the erection of a one-story addition, 60 x 120 ft., to the plant of the Spencer Turbine Co., West Hartford, Conn., has been let.

Contract has been awarded for the erection of a one-story and basement addition, 48 x 80 ft., to the plant of the Bausch Machine Tool Co., Springfield, Mass.

Plans are being drawn for a three-story building, 66 x 180 ft., for the American Wringer Co., Woonsocket, R. I. Bids for the foundation will be asked in the near future.

The B. Jahn Mfg. Co., New Britain, Conn., machinist, has purchased a site, 165 x 260 ft., at the corner of Cherry and Ellis streets, on which a new plant will be erected at some future date.

Permits for the construction of a four-story and basement, 60 x 128 ft., addition on State Street, and a four-story, 60 x 159 ft. addition on Organ Street, have been given the Bryant Electric Co., Bridgeport, Conn.

The Cutaway Harrow Co., Higgannum, Conn., recently merged with the Richardson Mfg. Co., as Bateman & Co., Inc., a Delaware corporation, will build an addition which will double its output.

The Fore River plant, Bethlehem Shipbuilding Corporation, Ltd., Quincy, Mass., will soon start work on two vessels for the Sinclair Oil Co., New York. The machine shop is still working on an order for 36 steam turbines for the Sparrows Point plant. An order for 18 reciprocating tug boat engines for the Moore plant, Elizabeth, N. J., has been completed.

The Modern Machine Co., 5 Mason Street, Providence, R. I., recently was acquired by John J. Flynn and Rudolph Skarks, formerly in charge of the screw machine tool department of the Brown & Sharpe Mfg. Co., that city. Mr. Flynn is president and Mr. Skarks treasurer. The plant has about 3,000 sq. ft. of floor space and the new owners are devoting their efforts to jig, fixture and general machine work, but at some future date plan to expand and develop a self-opening die holder, preliminary tests of which have been made.

The United States Hardware & Mfg. Co., Pawtucket, R. I., has been organized with John D. Sawyer as manager. He is connected with the Sawyer Belt Hook Co., and John R. White, who is superintendent of the J. S. White Co., is treasurer. The new company will manufacture insulator brackets, and break arms for the electric trade, furnace top plates, solder molds, floor flanges, brass and iron, solder pots, tack molds, and vent caps for the plumbing trade, grate bars, etc.

Frank O. Wells, Greenfield, Mass., has purchased the entire assets, including patent rights, of the V. E. LaPointe

Mfg. Co., Manchester, Conn., and has moved the equipment to Greenfield.

The Apsley Rubber Co., Hudson, Mass., has had plans prepared by the H. M. Hope Engineering Co., 185 Devonshire Street, Boston, for a five-story addition, 60 x 100 ft., to cost about $125,000.

The American Gun Barrel Mfg. Co., New Haven, Conn., has changed its name to the Avis Gun Barrel Co.

The Abrasive Machine Tool Co., East Providence, R. I., is awarding miscellaneous contracts for an addition to its plant.

The New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, steel balls, etc., will build a one-story addition.

The National Collapsible Tube Co., Providence, R. I., has filed plans for a one-story addition on Carpenter Street.

The Traut & Hine Co., New Britain, Conn., manufacturer of metal specialties, hardware products, etc., has increased its capital stock from $500,000 to $1,000,000.

The Athol Mfg. Co., Athol, Mass., manufacturer of pneumatic rubber products, has awarded a contract to L. B. Taylor, 521 Main Street, for a two-story plant, 50 x 140 ft., for its subsidiary organization, the Metropolitan Air Goods Co., to cost about $50,000.

The United States Rubber Co., Broadway and Fifty-eighth Street, New York, has filed plans for a new plant at Hartford, Conn., for its subsidiary organization, the Hartford Rubber Works, specializing in the manufacture of automobile tires. It will be located on Park Street, and will cost $3,000,000, including equipment. An electric power plant, to cost $264,000, will also be erected, as well as a building for employees to cost $402,500.

Fire, June 1, destroyed a portion of the plant of the Spiller Mfg. Co., 383 Dorchester Avenue, South Boston, Mass., manufacturer of iron castings for guns, etc., with loss reported at $50,000.

The Crocker Pen Co., 167 Oliver Street, Boston, Mass., has completed plans for a one-story addition to its plant at Everett, 60 x 120 ft., to cost $30,000.

The Willard Tool Co., Inc., Stratford, Conn., recently incorporated with a capital stock of $25,000 to manufacture tools, dies, etc., has been organized with M. W. Schillberg, president; F. W. Schillberg, secretary and treasurer; and A. O. Seastrom, director.

The Royal Typewriter Co., 364 Broadway, New York, has filed plans for a new plant on New Park Avenue, Hartford, Conn., to cost about $275,600.

The Oriole Electric Mfg. Co., Norwalk, Conn., has been incorporated with a capital stock of $50,000, by R. C. Craymer, 544 Studson Avenue, West Norwalk, and W. E. Tammany, South Norwalk, to manufacture electrical specialties.

Philadelphia

PHILADELPHIA, June 7.

A better feeling pervades the machinery selling interests due to a few more inquiries and sales the past week. With improved shipping conditions more deliveries of machines already ordered have been made in this district, particularly those which were tied up near New York because of the freight congestion. Neither the Norfolk & Western nor the Chesapeake & Ohio has purchased any of the machines asked for in their recent lists. A maker of turret lathes announces an advance of about 10 per cent, effective Aug. 1. Dealers in second-hand machines are harder hit by the recent period of dullness than manufacturers' agents, because the latter do not need business, as their books are filled for several months.

There have been a few inquiries for and sales of cranes. The Bethlehem Steel Co. is asking for a 25-ton crane for its tin plate mill at Sparrows Point, Md., with a span of 77 ft. The Baltimore Copper Smelting & Rolling Co. has bought three Roeper cranes, 33-ft. span, of 2 and 3-ton capacity. The Chester Shipbuilding Co. bought a crane bridge, as well as the shear for which it had been inquiring.

The Hess-Bright Mfg. Co., Front and Erie streets, Philadelphia, manufacturer of ball bearings, etc., has awarded contract to the H. J. Homan Co., 34 South Seventeenth Street, for a one-story forge shop addition.

The Abrasive Co., James and Fraley streets, Philadelphia, manufacturer of grinding wheels, etc., will build a one-story brick power plant, 57 x 60 ft., to cost about $25,000.

The L. H. Gilmer Co., Cottman and Keystone streets, Philadelphia, manufacturer of belting, has filed plans for a new three-story brick building, 93 x 160 ft., including power plant, to cost about $200,000.

The Ordnance Department, Washington, has had plans prepared for a number of one-story brick and concrete buildings at the Frankford Arsenal, Philadelphia, and is taking bids.

The Harrison Safety Boiler Works, Seventeenth Street, near Allegheny Avenue, Philadelphia, is building a one-story shop addition, 50 x 125 ft., on Lippincott Street, to cost about $35,000.

The Daniels Motor Co., Reading, Pa., has been organized to take over the plants and business of the Daniels Motor Car Co. and the Keystone Vehicle Co., both of Reading. The company recently acquired about six acres at Hunting Park Avenue and Westmoreland Street, Philadelphia, and has plans under way for a number of buildings. It is proposed to develop a capacity of 1500 high-grade pleasure cars during the coming year.

The Bridgman Brothers Co., 120 South Thirtieth Street, Philadelphia, manufacturer of heating specialties, steam fitters' supplies, etc., has acquired two plots of ground in the vicinity of its works, at Thirty-first and Walnut streets, 26 x 372 ft., for a consideration of $31,250; and on Thirtieth Street, extending to Thirty-first Street, 80 x 370 ft., for $93,750, to be used for expansion.

The Diesinger Motor Co., 1827 Chestnut Street, Philadelphia, is taking bids for a two-story service and repair building, 70 x 120 ft., at 2207 Chestnut Street.

The Philadelphia Gas Range Co., Thirteenth and Arch streets, Philadelphia, has acquired property at 1026 Arch Street, 22 x 136 ft., to be used in connection with its works.

The Pennsylvania Flexible Metallic Tubing Co., Broad and Race streets, Philadelphia, has completed plans for a new one and two-story plant, 44 x 110 ft., at Seventy-third Street and Elmwood Avenue.

The Vim Motor Truck Co., Philadelphia, manufacturer of automobile trucks, is removing its present plant at Twenty-third and Market streets to the former gun works of the Midvale Steel & Ordnance Co., Wayne Junction, recently acquired. The Market Street plant will be offered for rent. The company proposes a largely increased capacity. E. E. Smith is president.

The Essington Shipyard, Essington, near Philadelphia, was partially destroyed by fire, May 28, with loss estimated in excess of $150,000.

The Simmons Co., Twenty-fourth and Vine streets, Philadelphia, manufacturer of brass and iron beds, with headquarters at Kenosha, Wis., has awarded a contract to the Wark Co., 1737 Filbert Street, for a two-story addition to its building on Hunting Park Avenue, near Twenty-fifth Street, comprising a third and fourth floor, to cost about $200,000.

The Bergounan Rubber Corporation, Whitehead Road, Trenton, N. J., is having plans prepared by Hasselman & Marshall, architects, 53 West Thirty-ninth Street, New York, for three buildings, two stories, 60 x 150 ft., and one-story, 20 x 80 and 20 x 20 ft. respectively. The new plant is estimated to cost about $75,000. H. H. Coleman is president.

The Delaware, Lackawanna & Western Railroad, Scranton, Pa., is erecting a power plant at Nanticoke, 60 x 60 ft., at a cost of about $75,000.

The New Castle Foundry Co., New Castle, Pa., recently incorporated with a capital stock of $100,000 to manufacture iron and steel castings, has arranged for the erection of a plant. F. Sowersby, 409 Garfield Avenue, heads the company.

The crushing plant of the Union Stone Co., Saginaw, near York, Pa., comprising machinery, engine and boiler plant, etc., was destroyed by fire June 2, with loss estimated at $30,000.

The Hillvue Coal Co., Scranton Life Building, Scranton, Pa., will build a new coal washery at Gordon, Pa., to cost about $25,000. F. P. McLaughlin is manager.

Fire, May 29, destroyed a section of the plant of the Chester Steel Casting Co., Chester, Pa., including boiler shop, with loss reported at $50,000.

The Maccar Truck Co., Gilligan Street, Scranton, Pa., has completed plans for a one-story building, 95 x 200 ft., to cost about $75,000, and another one-story structure to cost $10,000.

The K. & L. Radiator Co., Allentown, Pa., has been incorporated in Delaware with capital stock of $1,200,0 0 by John M. Mack, W. J. Grives and J. H. Mack, to manufacture radiators and other iron and steel products.

The Sun Shipbuilding Co., Chester, Pa., has concluded negotiations with the City Council for the closing of certain streets in the vicinity of its plant to allow for proposed additions. The company plans for the construction of new drydocks, additional shipways, with shop and construction buildings, estimated to cost in excess of $1,000,000.

The Juruick Engineering Corporation, Allentown, Pa., manufacturer of ice and refrigerating machinery, is develop-

ing a new department of its business covering the manufacture of parts for silk machinery, steel spindles and kindred specialties. It is proposed to install new machinery to double approximately the present output of steel spindles and other products. M. F. Juruick is head.

Buffalo

BUFFALO, June 7.

J. H. Williams & Co., 400 Vulcan Street, Buffalo, manufacturer of drop-forgings and drop-forge tools, has arranged for a bond issue of $1,500,000 for proposed expansion. It has completed negotiations for the purchase of the drop-forge department of the Whitman & Barnes Mfg. Co., Chicago, with branch plant at St. Catharines, Ont. J. Harvey Williams is president.

The American Car & Foundry Co., 383 Babcock Street, Buffalo, has awarded contract to the J. W. Cowper Co., Inc., Fidelity Building, for two two-story additions, 50 x 140 ft. and 50 x 210 ft. respectively. The first will be used as a truck shop and the other structure for general production. The extensions will cost about $140,000.

The A. R. Williams Machinery & Supply Corporation, Buffalo, has filed notice of dissolution.

The American Tygard Engine Co., Inc., Buffalo, recently organized with a capital stock of $500,000, is preparing for active production at its plant at 148-50 North Division Street. The company has perfected a rotary steam engine which will be constructed in units of various capacities. Industrial Utilities, Inc., 17-19 Niagara Street, is interested in the enterprise.

The W. R. Townley Auto Lock Corporation, Rochester, N. Y., has increased its capital stock from $25,000 to $50,000.

The Crosby Co., 137-39 Pratt Street, Buffalo, manufacturer of sheet metal stampings, has awarded a contract to the B. I. Crocker Co., Niagara Life Building, for a one-story addition, 100 x 125 ft., to cost about $50,000.

The Globe Malleable Iron & Steel Co., 101 Greenway Avenue, Syracuse, N. Y., manufacturer of malleable castings, forgings, etc., has had plans prepared for a brick and steel addition, to be used as a machine and forge shop, to cost about $120,000, including equipment.

The Rochester Electric Products Corporation, Rochester, N. Y., has been incorporated with an active capital stock of $125,000 by Edward Smith, Jr., E. F. Davison and J. H. Kimmel, to manufacture electrical specialties.

The Stevens Hardware Co., Oneonta, N. Y., manufacturer of hardware specialties, has increased its capital stock from $50,000 to $90,000.

The Die Press Co., Cazenovia, N. Y., is taking bids through architects and engineers, Monks & Johnson, 99 Chauncey Street, Boston, Mass., for a two-story, reinforced-concrete plant, 60 x 160 ft., to cost about $70,000.

The Massey Machine Co., Pearl Street, Watertown, N. Y., manufacturer of governors and other machinery, has increased its capital stock from $100,000 to $200,000.

Baltimore

BALTIMORE, June 7.

The General Electric Co., Schenectady, N. Y., is arranging for the immediate installation of machinery at its plant on Columbia Avenue, Baltimore, recently acquired from the Government. The equipment will be new with some special machinery made expressly for the works. While present buildings will be utilized for initial operations, it is proposed to rebuild and remodel the existing structures at a later date. The plant will be devoted to the manufacture of switches and electric controlling devices, and will give employment to about 4,000 operatives when operating at capacity.

The Union Shipbuilding Co., Fairfield, Baltimore, will take bids early in July for a one-story machine shop, 100 x 300 ft., to cost about $100,000, including equipment.

The new plant of the Mayhew Steel Products Co., Inc., 291 Broadway, New York, at Hopewell, Va., will be operated in the name of the Mayhew-Virginia Corporation, organized with a capital stock of $250,000, as a subsidiary organization with headquarters in the Dixie Building, Petersburg, Va. Contract has been let to the Harrison Construction Co., Petersburg, for three initial buildings to cost $50,000, and to be equipped for the manufacture of pliers, wrenches and similar products. L. S. Smith is manager of the new company, and will be in charge of construction and machinery installation.

The Pangborn Corporation, Hagerstown, Md., manufacturer of sand-blast and other foundry equipment, plans to call for bids for the erection of a one-story addition during the summer, with estimated cost placed at $50,000.

The Crisfield Shipbuilding Co., Crisfield, Md., has disposed of its local shipbuilding plant to a new company, represented by Erbert L. Quinn, for a consideration said to be $50,000. A portion of the plant, including the machine shop, mechanical repair works, etc., was recently destroyed by fire with loss reported at $45,000. The new owner plans to rebuild this section of the works.

The Maryland Auto-Products Co., Hagerstown, Md., has been incorporated with a capital stock of $50,000 by James J. Doyle, John M. Hammersla and George E. Slaybaugh to manufacture automobile parts and other motor equipment.

The Paul Tire & Rubber Co., Salisbury, N. C., has been incorporated with a capital stock of $1,500,000 by Hayden Clement, W. E. McWhirter and E. C. Bramard to manufacture automobile tires. It is planning for the erection of works with a daily capacity of about 1500 tires.

The Norfleet Motor Corporation, Franklin, Va., is having plans prepared for a two-story service building and repair works 80 x 150 ft. Elliott Story heads the company.

The Kelly-Springfield Tire Co., Akron, Ohio, will build an electric power plant at its new tire manufacturing plant at Cumberland, Md., to cost in excess of $500,000.

The C. E. Hosbach Co., 10 North High Street, Baltimore, manufacturer of automobile bodies, etc., will build a one-story brick machine shop, 82 x 40 ft., to cost $4,000.

The Mutual Chemical Co., Dock and Wells streets, Baltimore, will build a steel crane runway and concrete pit.

The Auto-Meter Co. of Annapolis, Annapolis, Md., has been incorporated with $10,000 capital stock to manufacture a water meter for automobile radiators. The incorporators are Clarence A. Beardmore, Winson G. Gott and Charles F. Lee.

The McNamara Brothers Co., Inc., Baltimore, manufacturer of tanks and boilers, plans to build an addition, 70 x 170 ft. G. I. Donovan is manager.

The Baltimore Tin Stamping & Novelty Co., 1714 Aliceanna Street, Baltimore, recently incorporated with $15,000 capital stock, has been organized with James W. Tyson, 3d, as president and Jacob Lindley, secretary.

Quotations on machinery for the manufacture of stove pipe, etc., is desired by W. H. Hairston, Greensboro, N. C.

The Tractor & Machinery Co., New Bern, N. C., has been incorporated with a capital stock of $100,000 by A. F. Patterson, T. G. Hyman and J. B. Rice.

The Salem Iron Works, Winston-Salem, N. C., will construct buildings and install machinery for the manufacture of saw mills and special machinery. S. Bryant is president.

A. H. Douglas and A. W. Todd, Charleston, S. C., have organized the Atlantic Welding Works.

The Corden Safety Nut Lock Co., Florence, S. C., has been incorporated with a capital stock of $500,000 to manufacture safety nut locks, bolts, etc. L. E. Ogletree is interested.

The Champion Engineering Co., Kenton, Ohio, manufacturer of ornamental and architectural iron specialties, has awarded contract to the Foundation Co., Fulton Building, Pittsburgh, for a one-story addition, 60 x 400 ft., to cost about $150,000.

The machine tools in the Park plant of the Bartlett-Hayward Co., Baltimore, which was bought from the Government by the General Electric Co., were sold at public auction recently under orders of the Salvage Board of the Ordnance Department.

Cleveland

CLEVELAND, June 7.

The machinery market continues dull with sales limited wholly to single machines for immediate delivery. Some inquiry has come out for small lots but prospective purchasers usually indicate that they are not in a hurry to place orders. One local builder of turret lathes and screw machines reports some improvement in orders and inquiries this month as compared with May. Railroad buying is more active and among orders placed was one by a Western road for eight large turret lathes, and another by a Southern road for three similar machines.

Some curtailment in production is reported in machine shops affiliated with the tire industry and many metal-working shops have been compelled to slow down because of lack of material. Curtailment in the automobile industry has resulted in a number of cancellations by manufacturers of automobile parts who expect to get along without additional equipment. The easing up in demand is beginning to cause some improvement in deliveries. Some contracts for automobile castings have been canceled but these have not seriously affected foundries as it has permitted them to

take on other orders which otherwise they would have been compelled to decline.

The Ohio Crank Shaft Co., Cleveland, has been organized by W. C. Dunne, formerly production manager of the H. J. Walker Co., and will establish a plant for the manufacture of automobile crank shafts. Considerable machine tool equipment will be required and orders are now being placed.

The Frost Superior Fence Co., Cleveland, has sold its plant to the Chandler Motor Car Co., and will move to Warren, Ohio, where it will erect a new plant on a 6-acre site. Contracts will be placed shortly.

The Thew Automatic Shovel Co., Lorain, Ohio, has purchased the Lorain Castings Co. and will use the output of the foundry. F. A. Smythe, president of the shovel company, has become president of the castings company, succeeding B. G. Nichols.

The Timken-Detroit Axle Co. has completed extensions to its Canton, Ohio, malleable foundry, consisting of three foundry buildings, a melting shop and an office building. The capacity of the foundry will be more than doubled.

The Lewis Motor Mfg. Co., Fostoria, Ohio, recently organized, has established a temporary factory and plans to erect a new plant. Ralph C. Lewis, formerly general manager Beaver Mfg. Co., is president; J. E. McMillen, formerly production manager Commonwealth Motors Co., is vice-president; E. J. Bouchard, treasurer, and Joseph E. Krapp, secretary. The company will manufacture marine engines and expects later to make automobile motors.

The Elyria Steel Products Co. has increased its capital stock from $150,000 to $300,000.

Milwaukee

MILWAUKEE, June 7.

The first week of June has shown a further shrinkage of new business in machine tools, particularly in orders from the automotive industries, which for many months have been the most active buyers in this market. Makers of heavy-duty engines, however, used in motor trucks and tractors, continue to purchase. The uncertainties in the general situation and the continued acute traffic condition have combined to put a damper on the machine tool trade, but the opinion is that the lull is only temporary. With shops well sold up for 60 to 90 days they are resorting to no expediences in respect to reducing production or making price concessions.

The Invincible Metal Furniture Co., Manitowoc, Wis., has increased its capital stock from $100,000 to $200,000 to meet the growth of its business. Part of the new issue will be used for enlarging the plant, but actual work will not be undertaken at present, due to the high cost of construction and the difficulty of obtaining raw material and delivering finished products. The Manitowoc company is affiliated with a steel office furniture manufacturing concern at Grand Rapids, Mich., and specializes in equipment for banks and trust companies. P. M. Wege is general manager of both concerns.

The Macomber & Whyte Rope Co., Kenosha, Wis., manufacturer of wire rope and cable, has changed its corporate style to MacWhyte Co., effective June 1. The change is made because of the broadened scope of the output, which now includes stream lines for aircraft, mine car hitchings, safety detaching hooks for coal mines, and several other classes of material and devices now being put into regular production. Officers of the company are: President and general manager, George S. Whyte; secretary, Jesse S. Whyte; treasurer, E. W. Reitzel.

The Sterling Engineering Co., 419 Third Street, Milwaukee, manufacturer of steam and hot water heating specialties, has placed orders for a considerable list of new equipment, including lathes, drill presses, grinders and millers, to increase its capacity about 50 per cent. The capital stock was recently increased to finance material enlargement of output.

The Gray Motor Corporation, Detroit, is endeavoring to dispose of approximately $300,000 of its capital stock in Milwaukee to secure the establishment here of one of a series of branch assembling plants. Negotiations for from 40,000 to 60,000 sq. ft. of floor space in existing buildings are under way.

The Petit Mfg. Co., 68 Wisconsin Street, Milwaukee, will build a machine shop at Buffum Street and the Chicago, Milwaukee & St. Paul tracks, 60 x 125 ft., one story, of brick construction. Miscellaneous metal-working tools are being purchased. L. J. Petit is president. The nature of the prospective production has not been made public.

F. C. Blair & Son, Waukesha, Wis., gray iron founders and manufacturers of farm implements, have purchased a site on the Soo Line tracks at the south end of the city and as soon as conditions become more favorable will erect a new casting and machine shop, to cost about $60,000. For the present the shop at 340-346 Broadway will be kept in full operation.

The American Metal Products Co., 671 Kinnickinnic Avenue, Milwaukee, specializing in the manufacture of a patented bronze alloy and bearing metal, has increased its authorized capital stock from $150,000 to $300,000. While the foundry is steadily being enlarged, no important extensions or purchases of equipment will be made at this time.

The J. I. Case Plow Works Co., Racine, Wis., has broken ground for a four-story brick and reinforced concrete building, 123 x 138 ft., estimated to cost $150,000. The designing and construction contract is in the hands of Foltz & Brand, engineers, Chicago.

The Cortsa Motors Co., Milwaukee, has been incorporated with a capital stock of $100,000 to engage in general automotive engineering and to manufacture motors, motor cars, parts, etc. The incorporators are John C. Meyer, Milton F. Thompson, 256 Thirteenth Street, and Reimer C. F. Kurtze, 713 Thirty-sixth Street, Milwaukee.

Clarence and Irving Spillman, Waukesha, Wis., have opened a jobbing machine and repair shop at 314 West Main Street, under the firm name of Spillman Brothers' Machine Works.

Henry A. Elmer, Cooperstown, Manitowoc, Wis., is organizing a $50,000 corporation to engage in the manufacture of a number of patented farm tools of his design, principally a straw cutter. It is proposed to erect a plant in Manitowoc.

The W. H. Krueger Motor Car Co., 485 Jefferson Street, Milwaukee, has plans for a two-story fireproof garage, sales and service building, 40 x 125 ft., on Jefferson, near Biddle Street, estimated to cost $50,000.

The Marwin Motor Truck Co., Kenosha, Wis., manufacturer of quadruple drive commercial vehicles, has purchased 18 acres adjacent to the plant of the Winther Motor Truck Co., an inter-related corporation building rear-drive motor trucks. The two corporations are to be merged and the operations consolidated as soon as conditions are more favorable regarding new construction. The Kenosha Wheel & Axle Co., also affiliated with the same interests, and now occupying a plant at Winthrop Harbor, Ill., will then take over the present Marwin shops. Martin P. Winther is head of the three corporations.

The Meehan Mfg. Co., Milwaukee, recently incorporated with $25,000 capital stock to manufacture patented acetylene welding and cutting apparatus and other shop specialties, has increased its capitalization to $250,000 in preparation for engaging in active production. William M. Meehan is president and general manager.

The Evinrude Motor Co., 279 Walker Street, Milwaukee, which is erecting a new foundry and machine shop, 200 x 300 ft., on Atkinson Avenue, to be ready about Dec. 1, will manufacture, in addition to a gas engine motor set for row-boats and canoes, a farm oil engine. Inquiries and purchases of new equipment are being made. C. J. Meyer is president.

The Ladish Drop Forge Co., Cudahy, Wis., which recently increased its capital stock from $300,000 to $700,000, has completed a five-year building program and is now occupying a new shop, 80 x 300 ft. The power house has been doubled in size. The plant is employing 750 men in three 8-hr. shifts. C. L. Coughlin is vice-president and general manager.

The Wetmore Reamer Co., 210 Sycamore Street, Milwaukee, expects to occupy its new plant, 75 x 115 ft., on Twenty-seventh Street, near St. Paul Avenue, about Aug. 1, when it will enlarge its production to embrace a complete line of cylinder reamers as well as the original line of expanding reamers. The officers are: President and general manager, Paul B. Rogers; vice-president and works manager, C. P. Wetmore; secretary and sales manager, Philip H. Dorr. L. Ray Smith, president A. O. Smith Corporation, is a director.

Pittsburgh

PITTSBURGH, June 7.

The Americolite Co., 101 Park Avenue, New York, manufacturer of lighting fixtures, lamp reflectors, etc., has acquired the works of the Standard Steel Box Co., near Bridgeville, Pa., for a new plant. The property consists of a one-story factory, with site totaling about one acre, and was secured for a consideration of about $35,000. It is proposed to equip the plant at once and inaugurate operations at the earliest date.

The Rust Engineering Co., 1901 Fifth Avenue, Pittsburgh, manufacturer of structural and mechanical specialties, has dissolved the former corporation of this name to incorporate

under Delaware laws. In addition to its local establishment the company will maintain branches in the District National Bank Building, Washington, D. C., and Woodward Building, Birmingham, Ala. E. M. Rust, S. M. Rust and E. J. L. Rust head the company.

The new plant of the Pittsburgh Screw & Bolt Co., Pittsburgh, on Preble Avenue, will cost about $300,000, instead of $30,000, as previously announced. It will be two stories, reinforced-concrete and steel, with about 39,000 sq. ft. of manufacturing space.

The Pennsylvania Coal Co., 705 Smith Street, Dunmore, Pa., is having plans prepared for a new coal breaker at its properties at Pittston, to cost about $250,000. William P. Jennings is superintendent.

The Keystone Ironing Machine Co., Pittsburgh, manufacturer of special machines, has increased its capital stock from $50,000 to $200,000.

The Barrett Machine Co., Pittsburgh, refrigerating machinery and equipment, has removed its plant to a three-story building at 912-16 Behan Street for increased operations. The first floor will be given over to a machine shop, a portion of the second floor will be used as a pipe shop for the manufacture of pipe coils, etc., and on the third floor a repair department will be operated for light work.

The Consolidated Coke Co., Oliver Building, Pittsburgh, is planning for the erection of a loading landing at its coke works at Grays Landing, Fayette County, to be provided with loading and hoisting machinery with capacity of about 4000 tons a day. It has recently acquired the Sharpneck Mines of the Superior Coal Co., vicinity of Brownsville, and plans to electrify the works.

The Diamond Coal & Coke Co., Pittsburgh, is planning for the erection of a coal tipple in the vicinity of its properties, Barking Station, on the Allegheny River.

The Taylor Coal Co., 173 Morgantown Street, Uniontown, Pa., will install new loading machinery, screens and other equipment at its properties at Flemington, W. Va.

The Standard Machine Co., Huntington, W. Va., has been incorporated with a capital stock of $75,000 by F. L. Parr and G. D. Miller, Huntington, and F. M. Burgess, Mannington, to manufacture mining machinery and equipment.

The Bureau of Yards and Docks, Washington, D. C., is arranging for the erection of a new power plant in the vicinity of Lock No. 48, Ohio River, near Wheeling, W. Va.

The Hinton Foundry & Machine Co., Hinton, W. Va., has been organized by A. D. Daly and H. M. Caff, to manufacture iron castings, machine parts, etc.

The National Electric Service Co., Morgantown, W. Va., has been incorporated with a capital stock of $50,000 by Daniel A. Maurer, Walter E. Watkins, Fairmont, and John R. Campbell, Morgantown, to manufacture electrical specialties.

The Youngstown Boiler & Tank Co., Youngstown, Ohio, has increased its capital stock from $100,000 to $500,000, following the erection of an addition to its plant.

Detroit

DETROIT, June 7.

The machine tool and supply markets remain exceedingly quiet. Deliveries are almost at a standstill with the exception of a few that have been made via Lake steamer from the East. Purchasers are withholding inquiries until conditions become more settled as to credits, prices and deliveries.

Practically all the machinery and equipment for its plant in Belding, Mich., has been placed by the Jacquet Motors Corporation. To provide for future expansion, it has taken an option on twenty-eight acres adjoining the factory. The company will turn out a four-cylinder car.

The Superior Machine & Engineering Co., Detroit, contemplates the erection of a two-story plant, 100 x 120 ft.

The Calhoun Castings Co., has recently been organized in Battle Creek, Mich., with M. J. Franklin, as the head.

It is expected that the main building of the Wills-Lee automobile plant at Marysville, Mich., will be completed in July and that equipment will be installed so that the company may start production in August.

The Clark Equipment Co., Battle Creek, Mich., has under construction works west of the city, including machine shops and a power plant. When completed it will start production with about 500.

The Johnson Automatic Sealer Co., Battle Creek, is building a foundry near the Clark Equipment Co.'s new plant.

The plant of the Briggs Mfg. Co., Detroit, was recently damaged by fire with an estimated loss of $25,000.

The Grand Rapids Foundry Co., Grand Rapids, Mich., is planning the erection of an addition. No details have been given out as yet.

The Charlevoix Machine & Tool Co., 6337 Charlevoix Avenue, Detroit, has been incorporated with a capital stock of $20,000. It will conduct a general machine shop business, specializing in the production of special tools and jigs. D. W. Klein is president.

The General Machine & Tool Co., Jackson, Mich., will erect a plant 90 x 150 ft., to provide for its increased business which has outgrown present accommodations.

An issue of $25,000 of preferred stock of the Flint Foundry Co., Marshall, Mich., will be used for enlargement of the plant.

The Surenac Machine Company of Benton Harbor, Mich., expects to build an addition to cost about $50,000.

Harry M., Edward H., and Frederick L. Jewett, Detroit, have organized the Jewett Phonograph Co., capitalized at $250,000, to manufacture an improved type of phonograph, with office at 1730 Penobscot Building. Edward H. Jewett is president.

The E. F. Lyons Spring & Axle Co., Detroit, plans the erection of a two-story addition, 75 x 100 ft., to cost approximately $50,000.

The Detroit Ring Casting Co., Plymouth, Mich., which was recently incorporated with a capital stock of $125,000 by the owners of the Detroit Piston Ring Co., will soon be in the market for special equipment for piston ring manufacture. The office of the company is at 7401 Richmond Avenue, Detroit.

Fire damaged the buildings of the Industrial Foundry Co., of St. Johns, Mich., recently, causing a loss of about $15,000. Only a few weeks previously the plant had been badly damaged by a tornado and reconstruction work had barely been finished.

The Leroy-Broehm Foundry Co., 932 Jefferson Avenue, Detroit, recently organized with a capital stock of $100,000, is expected to start production this month. It will make brass castings.

F. W. Kinde heads the Huron Truck Co., which has been organized at Bad Axe, Mich., and associated with him are W. R. Lyons, vice-president; C. C. Henney, secretary, and Fred M. Cross, treasurer. A factory has been leased and production of 50 trucks this year has been scheduled.

In our issue of May 27, it was stated that the Pressed Metals Co. of Canada, Ltd., which is erecting a plant at Marysville, Mich., had changed the name of the American company to the Michigan Bushings Corporation. This is incorrect. The name of the American company is the American Bushings Corporation.

A new one-story power plant, 75 x 84 ft., to cost about $50,000 will be erected by the Battle Creek Sanitarium, Battle Creek, Mich.

The Premier Warm Air Heater Co., Dowagiac, Mich., manufacturer of heating equipment, will build a one-story plant, 120 x 360 ft., to cost about $100,000 with equipment.

Bids will be received up to June 30, for the one-story machine shop, 55 x 116 ft., to be erected by the Congress Tool & Die Co., 7 East Fort Street, Detroit, estimated to cost about $20,000. A. Clubb, Jr., 53 Cadillac Square, is the architect.

The American Furnace & Foundry Co., Milan, Mich., will build a one-story plant, 80 x 250 ft., for the manufacture of furnaces and furnace castings, to cost about $150,000, including equipment. E. S. Watson is president.

The Hamilton Motors Corporation, Grand Haven, Mich., is taking bids for a one-story addition, 60 x 130 ft., to cost about $75,000. It will be used by the Apex Truck Co., manufacturer of motor trucks, an affiliated organization.

The Packard Motor Car Co., Detroit, has arranged an expansion program calling for an appropriation of $16,000,000 for extensions and equipment. About $2,000,000 will be used for enlargements in the truck department. Certain departments of the pleasure car works will also be increased at an early date.

The Upton Machine Co., St. Joseph, Mich., is taking bids for a one-story machine shop to cost about $45,000. Davidson & Weiss, 53 West Jackson Boulevard, Chicago, are the architects.

The Dort Motor Car Co., Flint, Mich., has filed plans for a two-story machine shop on South Street, 40 x 170 ft.

The Sunny Home Electric Co., 1469 East Grand Boulevard, Detroit, manufacturer of electric specialties, has filed plans for a one-story machine shop, 78 x 160 ft., on Scotton Avenue.

The Gray Motor Corporation, Detroit, has been organized with a capital stock of $4,000,000 to take over the plant and business of the Gray Motor Co., manufacturer of auto-

mobiles. F. F. Beall is president and William H. Blackburn, plant manager.

The Fletcher Machine Co., 547 McDougall Street, Detroit, has awarded a contract to the Charles R. Schewe Co., Chamber of Commerce Building, for a one-story machine shop, 30 x 96 ft., on Garfield Street, to cost $10,000.

Chicago

CHICAGO, June 7.

Although the allotment among dealers of about $200,000 worth of equipment for the Burlington Railroad will bring up sales averages to a fairly large figure, the market is otherwise slow. The contraction in business the past several weeks has resulted in improving deliveries on some lines of tools. This betterment is not noticeable in connection with the products of Cincinnati shops which are still crippled by a machinists' strike, and whatever gain may have been made by Rockford builders threatens to be wiped out as a result of the molders' strike in that city, which is curtailing the output of castings on order. Transportation is gradually improving and the shipments from builders, except those in Cincinnati, are moving more freely. Shipments from local stores are also being handled more expeditiously, but it is not to be inferred from this that transportation is back to normal. Although some dealers' floor stocks are still seriously depleted, others have their stock rooms reasonably well filled. Provided that the buyer can find the particular type of machine in stock that he desires, he is able to secure better delivery than was possible a month or two ago. Movement from stores, however, may be interfered with by the threatened strike of the machinery handlers' union, which the local machinery houses propose to oppose with a united front. Prices remain substantially the same, although rumors of possible early advances are heard. Occasional individual price changes continue to be made from time to time, the latest being an advance of 15 per cent on a line of planers.

The automotive industry which was prominent as a buyer late in 1919 and early this year is no longer a factor in the market, and this may account partially for the decline in the volume of business since the first quarter. Whether the transportation situation is solely responsible for reduced activity on the part of the motor and tractor plants is still an open question.

The principal new list which has appeared emanates from the P. B. Yates Machine Co., Beloit, Wis., calling for three 24-in. x 24-in. x 6-ft. planers, one 18-in. x 96-in. plain grinder, one four-spindle automatic drill, three 20-in. lever drills, one 3½-ft. belt-drive radial drill with gear box, one sensitive radial drill and one No. 2 milling machine. Outside of the Burlington purchase, buying has been limited principally to one or two machines. Among the exceptions is the Barton Axle Co., Barton, Wis., which has bought one surface grinder, one disk grinder, one heavy-duty drill, one multiple drill head and several larger arbor presses. This company also purchased several engine lathes from the Government and is still in the market for three or more standard tools. Another fair-sized purchase covered five Fraser semi-automatic grinding machines for grinding rolls for roller bearings.

Construction in Chciago is still on the decrease. Permits were taken out in May for 296 buildings, fronting 10,968 ft., involving a total cost of $5,659,400, as against 827 buildings fronting 23,343 ft., and costing $7,190,200 for the same month a year ago. The frontage for May, 1920, is the lowest in 30 years, except one, 1898.

The Economy Fuse & Mfg. Co., 329 West Kinzie Street, Chicago, has let a contract for another plant unit, 94 x 290 ft., one-story, to be built at 2653-61 Greenview Avenue at a cost of $90,000. The first unit cost $150,000, making a total of about $240,000 for plant improvements.

The Wood Hydraulic Hoist & Body Co. 2911 Indiana Avenue, Chicago, manufacturer of track dump hoists is receiving bids through Foltz & Brand 111 West Washington Street on a one-story factory, 60 x 275 ft., to cost $75,000.

The Perfection Co., manufacturer of automobile accessories, 2820 South Wabash Avenue, Chicago, has had plans prepared by Holton, Seelye & Co., 140 South Dearborn Street, for a two-story factory at Wabash Avenue and Thirtieth Street.

The International Engineering & Mfg. Co., Arthur W. Dixon, attorney, room 1628, 127 North Dearborn Street, Chicago, has had plans prepared by Marshall H. Paulsen, engineer, for a one and two-story plant, 90 x 200 ft., which will be the first unit of works to be constructed at Kokomo, Ind., at a cost of $75,000.

The Bell & Howell Co., manufacturer of moving picture machinery, 1801 Larchmont Avenue, Chicago, has let contracts for a three-story addition, 50 x 105 ft., to cost $50,000.

The Commonwealth Edison Co., Chicago, is having plans drawn by Marshall & Fox, 421 North Michigan Avenue, for a power plant, 250 x 500 ft., at East Ninety-ninth Street and Calumet River, to cost $5,000,000.

F. W. Clement, 941 North Robey Street, Chicago, plans the erection of a machine shop, 22 x 24 ft.

The Chuse Engine & Mfg. Co., Mattoon, Ill., will increase its capital stock from $300,000 to $500,000.

The Northern Steel & Iron Co., Cleveland, Ohio, will reopen its plant at Fulton, Ill., for the manufacture of castings for automobile engine parts. D. J. Higgins will be superintendent.

The Daisy Fence & Post Co., Lafayette, Ind., proposes to construct a two-story plant on Wabash Avenue, near Manford Street.

The University of Montana, Bozeman, Mont., is having plans prepared for a one-story machine shop, 80 x 100 ft., to cost about $25,000, to be used by the State College of Agriculture and Mechanic Arts.

Fire, May 16, destroyed portions of the plants of the Chamberlain Machine Works and the Metcalf Foundry Co., Waterloo, Iowa, with loss estimated at $200,000.

The Bureau of Yards and Docks, Washington, D. C., has had plans prepared for a new two-story power plant, 40 x 65 ft., at Ohio River Dam No. 48, near Cypress, Ind., to cost about $45,000. Col. G. M. Hoffman, Post Office Building, Louisville, Ky., is in charge.

The National Spring Products Co., Twenty-first Street, Gary, Ind., has arranged for the immediate erection of a one-story addition, 93 x 245 ft., to cost about $60,000.

The Channon Emery Stove Co., Quincy, Ill., is planning for the installation of new power press equipment.

The Illinois Car & Mfg. Co., Hammond, Ind., has awarded contract to Anderson Brothers, Gary, Ind., for a one and two-story addition to cost about $100,000.

Fire, June 2, destroyed the pumping plant of the Standard Oil Co., Greeley, Kan., with loss estimated in excess of $750,000.

The La Salle Iron Works, 2305 South Halsted Street, Chicago, is taking bids for a new one-story plant at West Hammond, Ind., 180 x 220 ft., to cost about $250,000, including machinery. Ronneberg, Pierce & Hauber, 10 South La Salle Street, are the architects.

Cincinnati

CINCINNATI, June 7.

The machine-tool business the past week has been only fair. A considerable demand for some lines of tools was noted and a falling off in others, particularly where delivery was more or less indefinite. However, a fair volume of orders was received, but for the most part of one or two machines each. The Hocking Valley Railroad was a purchaser against the list issued some weeks ago, and the Big Four also bought engine lathes for its Beech Grove, Ind., shops. This purchase, however, is expected to be considerably augmented in the near future, as it is understood that this road is now preparing a list of requirements for its various shops. The New York Central also was a purchaser, taking one motor-driven engine lathe for one of its Eastern shops. The Chicago, Burlington & Quincy, which made purchases in Chicago last week, is expected to buy some of the remaining tools in the Cincinnati market, and action on the Norfolk & Western and Chesapeake & Ohio lists is confidently expected within the week.

Cancellation of several tools has been received the past week, but this is ascribed to the fact that deliveries were more or less indefinite. Eastern buyers are reported to have asked several local manufacturers to hold up shipments for a time, or until transportation conditions improve to such an extent that they will have an even chance of getting the machines without having their money tied up for too long a period.

The machinists' strike, now in its fifth week, shows little improvement, though a number of workers have returned to their old jobs. In some cases employers are refusing to take back union men, claiming that their experiences in the past, especially regarding signed agreements, does not justify their recognition in the future. A number of plants which have been closed temporarily will, it is understood, reopen their shops next week, and it is said that approximately 40 per cent of the men now out will return to work.

The G. A. Gray Co., manufacturer of the Gray planers, has acquired about 17 acres in the Norwood section of Cincinnati and it is understood will build a new plant. Plans for the construction of the buildings are being prepared, but nothing definite is expected for some time.

The Ferro-Concrete Construction Co. has secured the

general contract for a new power house for the Colin-Gardner Paper Co., Middletown, Ohio. It will be 50 x 50 ft. and cost $45,000. A turbine power plant will be installed.

The Dragon Mfg. Co., Marietta, Ohio, has increased its capitalization from $10,000 to $100,000 and will erect a new plant in Norwood. It manufactures accessories for use on oil well pumps. H. T. Torner is president.

The Liberty Sheet Metal Co., Main Street, Hamilton, Ohio, has purchased the former plant of the Hamilton Castor Co., 350 Hanover Street, and will move into its new quarters in the near future. Increased business is given as the reason for acquiring larger quarters.

The Ideal Welding Co., Dayton, Ohio, has been incorporated with a capital stock of $25,000 by J. D. Kerr, W. D. Owsley, A. H. Scharrer and E. McMullin.

The Bowling Green Die & Tool Co., Bowling Green, Ohio, will increase its capitalization from $25,000 to $100,000.

The Ohio Valley Machine Co.'s property at Marietta, Ohio, was sold recently to the Pattin Brothers Co. of that city for a consideration said to have been $31,000. The Ohio Valley company went into the hands of a receiver some time ago and the property was advertised for sale.

The Poole Lineograph Co., Dayton, Ohio, has been incorporated with a capitalization of $300,000 by M. D. Larkin, G. W. Miller, W. J. Poole, E. W. Vossler and C. W. Sander. It is the intention of the company, as soon as the necessary financing is completed, to engage in the manufacture of a circular letter printing apparatus.

The Wise-McClung Co., New Philadelphia, Ohio, manufacturer of washing machines, etc., has completed plans for a new three-story plant to cost about $300,000, including equipment.

The Dayton Rubber Mfg. Co., Dayton, Ohio, is planning for extensions in its plant for increased production. The company has recently increased its capital to $10,000,000.

The Spencer Metal Products Co., Spencer, Ohio, has completed plans for a one-story addition, 40 x 180 ft., to cost about $100,000, including equipment. G. E. Bouthinon is general manager.

The Recording & Computing Machines Co., Dayton, Ohio, has increased its capital stock to $4,000,000.

The Columbus Tire & Rubber Co., Columbus, Ohio, is planning for the erection of additions for the manufacture of inner tubes. The company recently increased its capital to $1,275,000.

The Climax Rubber Co., Citizens Bank Building, Columbus, is planning for the erection of a main two-story works, 140 x 190 ft., and two-story power plant. A factory is also operated at Huntington, W. Va.

The American Motor Mfg. Co., 35 North High Street, Columbus, is planning for the installation of new machine tools and other equipment.

Bauer Brothers, Springfield, Ohio, manufacturers of grinding and separating machinery, are planning for the erection of a one-story foundry, 200 x 250 ft., to cost about $70,000.

The Bock Bearing Co., Phillips Avenue, Columbus, manufacturer of automobile bearings, a subsidiary of the Standard Parts Co., Cleveland, is having plans prepared for a two-story and basement addition, 60 x 260 ft., to cost about $100,000.

The Scheetz Coal Co., Martins Ferry, Ohio, will build a new steel tipple at its coal properties.

Indianapolis

INDIANAPOLIS, June 7.

Stoughton A. Fletcher, president Fletcher American National Bank, Indianapolis, and others have secured the controlling interest in the Midwest Engine Co., manufacturer of small tractors, trucks and tractor engines. John Wood will continue as president and the board of directors includes Walter Marmon, president Nordyke & Marmon Co.; J. J. Cole, president Cole Motor Co.; Lucius M. Wainwright, president Diamond Chain Co.; Charles B. Sommers, president Gibson Co.; Carl G. Fisher and James A. Allison, of the Presto-O-Lite Co. The new capitalization will include $8,000,000 of 8 per cent preferred stock.

The H. O. B. Mfg. Co., Indianapolis, has been incorporated with $50,000 capital stock to manufacture fuel-saving devices. The directors are William F. Hiatt, David G. Ong and Leonard V. Bedell.

Charles S. Brossman, consulting engineer, Indianapolis, has been engaged to supervise the work of enlarging the municipal light and power plant at Anderson, Ind., at a cost of $350,000.

The International Automobile Association, Muncie, Ind., has been organized with $50,000 capital stock, to manufacture automobile accessories. The directors are Fred Lee Elliott, F. O. Northington and M. De Elliott.

The Lorraine Car Co., Richmond, Ind., has increased its capital stock from $500,000 to $1,500,000.

The Midway Electric Co. has been incorporated at Shipshewana, Ind., with $25,000 capital stock to supply heat, light and power. The directors are Jonathan Farver, Frank Bevington and Edward A. Wolfe.

The Otkon Mfg. Co., South Bend, Ind., has been incorporated with $100,000 capital stock to manufacture machinery. The directors are W. S. Bowman, George E. Mander and Ralph DeGraff.

The North Webster Mfg. Co., has been incorporated at North Webster, Ind., with $25,000 capital stock to supply light and water. The directors are Fred Watkins, William H. Bockman and David Cunningham.

The Mutual Truck Co., Terre Haute, Ind., has increased its capital stock to $5,000,000. Its plant, now under construction, will be 400 x 750 ft., and is expected to be completed in 18 months. It is being constructed in units, approximately 150 x 200 ft.

The Kokomo Brass Works, Kokomo, Ind., is well under way with its addition to its aluminum foundry. Two 1000-lb. electric furnaces will be installed.

The Kokomo Malleable Co., Kokomo, Ind., has been incorporated with $350,000 capital stock. The officers include A. G. Seiberling, president; Edward Bridges, vice-president and M. Cook, secretary and treasurer. Mr. Bridges is also vice-president of the Service Motor Truck Co., Wabash, Ind.

The business of Charles T. Tarpenning, 301 Virginia Avenue, Indianapolis, has been reorganized and will in the future be known as the Tarpenning-LaFollette Co., engineer and sheet metal contractor. Mr. Tarpenning has had more than 30 years' experience as a sheet metal worker, pattern maker and designer. B. E. La Follette was formerly sales engineer and chief engineer of the American Blower Co., Detroit.

The Central South

ST. LOUIS, June 7.

The Brecht Co., 1201 Cass Avenue, St. Louis, manufacturer of packing house machinery, etc., has awarded a contract to the Reinschmidt Contracting Co., Victoria Building, for a two-story machine shop, 107 x 130 ft., to cost about $75,000. G. A. Brecht is president.

The Tulsa Burner Appliance Co., Tulsa, Okla., has been incorporated with a capital stock of $30,000 by W. S. Lee, George Ruvkman and W. S. Lee, to manufacture oil burning equipment, etc.

The American Bed Co., 1820 Park Avenue, St. Louis, manufacturer of brass and steel bedsteads, has awarded a contract to A. Doerflinger, 2904 Juniata Avenue, for a two-story plant, 75 x 120 ft., at Eighteenth and McNolte avenues, to cost about $30,000.

The Continental Piston Ring Co., Memphis, Tenn., has awarded a contract to the Fisher Lime & Cement Co., Memphis, for a new one-story plant, 153 x 217 ft. A large portion of the structure will be used as a machine shop. It is proposed to develop a capacity of about 600,000 piston rings a month. B. G. Covington is president and general manager.

B. F. Avery & Sons, Seventh Street, Louisville, manufacturers of agricultural implements, have awarded contract to the National Concrete Construction Co., Board of Trade Building, for a five-story and basement building, 127 x 260 ft., and two-story and basement building, 83 x 178 ft., to cost about $250,000.

The Inland Refinery Co., Cushing, Okla., is planning to rebuild the portion of its plant recently destroyed by fire with loss estimated at $100,000. Eugene Blaise is in charge.

The Vatter Catkey Motor Co., Frankfort, Ky., is completing plans for a three-story and basement service and repair building, 50 x 112 ft., to cost about $60,000.

The Sterns Tire & Tube Co., 2100 Krelin Avenue, St. Louis, manufacturer of automobile tires, is planning for the erection of two new buildings, 30 x 175 ft., and 30 x 40 ft., respectively, to cost about $40,000, in the vicinity of Wellston, Mo.

The Traffic Motor Truck Corporation, 5220 North Second Street, St. Louis, has awarded a contract to the Murch Brothers Construction Co., Railway Exchange Building, for a new one-story plant, 150 x 150 ft. A portion of the structure will be used for the manufacture of gears for steering service, axles, etc. Guy Wilson is president.

The New Albany, Ind., division of the International Harvester Co. will shortly be moved to Louisville, the company

having secured a site at Fourteenth and Walnut streets. It moved from Kentucky several years ago as a result of anti-trust legislation.

The American Motorcycle Co., Louisville, Ky., Otto Seelbach and others interested, have purchased for $30,000 a former Government building in Louisville, which will be equipped to manufacture motorcycles. The company is capitalized at $200,000.

The People's Packing Co., Oklahoma City, Okla. will equip a packing and refrigerating plant requiring about $50,000 worth of machinery.

The Santuna Oil Co., Oklahoma City, Okla., will equip an oil refinery, the first unit to cost $100,000.

The Indiahoma Refining Co., Okmulgee, Okla., will expend about $1,500,000 in additional refining capacity.

The Hagen Metal Products Co., Detroit, will equip a branch plant at St. Louis.

The Tippy Lumber Co., Fountain Hill, Ark., J. P. Holmes, president, Hamburg, Ark., will install about $50,000 worth of saw mill machinery.

The Fortified Mfg. Co., 220 Gumbel Building, Kansas City, Mo., will equip a plant for the manufacture of electric heating devices.

The F. H. Lynch Tire & Rubber Co., Carthage, Mo., will equip a manufacturing plant, 60 x 350 ft.

The Gulf States

BIRMINGHAM, June 7.

The Continental Tire & Rubber Co., Gulfport, Miss., recently organized with a capital stock of $300,000 to manufacture cord tires, has acquired a local building which will be remodeled to accommodate the new line of manufacture. The machinery installation will provide for a daily capacity of about 150 tires. George A. Wood is vice-president, and J. S. McClane, secretary.

The Texas Public Service Co., Fort Worth, Tex., is planning for extensions in its electric generating plant to cost about $100,000. A. V. Foster is president.

The Dunigan Tool & Supply Co., Breckenridge, Tex., has been incorporated with a capital stock of $125,000 by J. B. Dunigan, J. B. Bissett and T. J. Hinerman, to manufacture tools, machine parts, etc.

The Hydraulic Machinery Mfg. Co., Port Neches, Tex., manufacturer of turbines, motors, etc., has completed plans for a new three-story plant, 60 x 140 ft., to cost about $75,000.

The Peck Tank Co., Fort Worth, Tex., has been incorporated with a capital stock of $50,000 by H. M. Peck, P. F. Lea and T. J. Waggoner, to manufacture tanks, boilers, stacks, etc.

Fire, May 22, destroyed a portion of the plant of the Texas Gas & Electric Co., Wharton, Tex., with loss estimated at $100,000.

The Desdemona Oil & Refining Co., Desdemona, Tex., is planning for the erection of a new oil refinery in the vicinity of Stephenville, Tex., to cost about $250,000. The initial plant will have a daily capacity of about 2500 bbl. Daniel W. Powers is president.

The Cowart Non-Blowout Tube Co., Midlothian, Tex., recently organized, has acquired a local building and will establish a plant for the manufacture of automobile tire tubes.

The Alamo Iron Works, San Antonio, Tex., is planning for the erection of a one-story machine shop to cost about $30,000.

Jesse Knight, Yoyah, Tex., has been granted a franchise by the local Common Council for the construction of a light and power plant.

The National Forge Co., Anniston, Ala., recently incorporated with a capital stock of $50,000 to manufacture forgings, has been organized with B. F. Lively, president, and Thomas C. King, secretary and treasurer. The company contemplates the erection of a local plant.

The Farmers' Gin Co., Canton Exchange Bank Building, Canton, Miss., recently organized, is planning for the erection of a new compress plant with a daily capacity of about 75 bales of cotton.

The Oldsmar Tractor Co., Oldsmar, Fla., manufacturer of motor tractors, is planning for the erection of new buildings to double approximately its present capacity. One of the structures will be used as a foundry and considerable equipment will be installed. The company recently increased its capital stock from $100,000 to $500,000.

The Waggoner Supply Co., Fort Worth, Tex., is arranging to build a plant for the manufacture of oil field equipment and supplies. The company has a capital stock of $1,000,000 and has been incorporated by Warren Waggoner, William Kent and R. W. Davis.

The Burge Mfg. Co., Fort Worth, has increased its capital stock from $50,000 to $100,000 and will enlarge its plant for the manufacture of show cases and store fixtures.

The International Shipbuilding Co., Pascagoula Miss., has increased its capital stock from $1,000,000 to $5,000,000 and will enlarge its plant.

The Saline River Hard Wood Co., Yazee City, Miss., will double its capacity installing about $125,000 worth of new machinery.

The Pacific Coast

SEATTLE, June 1.

Manufacturing and jobbing interests in the Northwest report a downward tendency in business. The extreme difficulty experienced in securing shipments from the East is curtailing all lines of manufacture and causing considerable apprehension as to the future. Buyers show a tendency to delay purchases, feeling that the crest of high prices has been reached and that a possible reduction may be looked for. Demand for sawmill and shingle mill equipment has been well sustained and small tools have been fairly active.

The shipbuilding industry in Seattle at present is employing 3400 men, with the plants engaged entirely on private work. While the big steel construction yards are closed, with one exception, the repair plants and small yards are experiencing unusual activity.

The Commercial Welding Co., Seattle, owned by Paul Eidsmore, plans the construction of a new welding and repair plant in the near future. It holds contracts for electric welding on a number of scout cruisers for the Government.

The Puget Sound Packing Co., Seattle, is building a three-story addition, 57 x 60 ft. New equipment will be installed.

The Standard Brass Foundry, Portland, has been incorporated by Frank McCrillis, E. E. Small and others, and contemplates establishing a plant for the manufacture of metal castings and parts.

The National Axle Co., San Jose, Cal., is building a plant which it expects to have in operation by Sept. 1 and has placed contracts for its machine tool equipment, approximating $130,000, with Los Angeles machinery houses.

Plans have been completed and bids asked for the erection of a one-story steel, brick and concrete shop for Kleiber & Co., manufacturer of motor trucks, at Juniper and Folson streets. It is estimated to cost $30,000.

The Southern Pacific Co., 65 Market Street, San Francisco, will build a new foundry, paint shop, blacksmith shop, carpenter shop and boiler house in South San Francisco.

The James H. Todd Can Cutting Co., Oakland, has been incorporated with a capital of $50,000 by James H. Todd, L. B. Todd and A. J. Woolsey to manufacture can-opening machines.

The Oil Mining Equipment Co., 2026 Santa Fe Avenue, Los Angeles, is arranging for the erection of a new plant, to include a main works, 80 x 550 ft., with extension, 60 x 150 ft., boiler plant and other structures.

The Economic Tool Co., 1032 South Grand Avenue, Los Angeles, has filed notice of organization to manufacture tools, dies, etc. E. O. Myers, 119 North Hope Street, heads the company.

The Union Gas Engine Co., Kennedy and Boehmer streets, East Oakland, Cal., has arranged for the installation of additional machinery for increased production.

The Johnson Electric Washer Co., 2074 Market Street, San Francisco, has awarded contract to the Austin Co., Pacific Building, for a one-story brick and steel plant at Fortieth and Adeline streets, Emeryville, Cal., to cost about $40,000.

The Standard Appliance Co., 1214 South Figueroa Street, Los Angeles, has been organized to manufacture mechanical appliances. Henry W. Allers, Jr., 1753 West Twenty-second Street, heads the company.

The Union Oil Co., Los Angeles, will erect a machine shop, repair works and other buildings at San Pedro Harbor.

The Miller Rubber Co., Akron, Ohio, manufacturer of automobile tires, is considering the erection of a new plant in the vicinity of Los Angeles.

A new electrically operated tramway system is being considered by the Port Costa Brick Works, Port Costa, Cal., to be installed for handling clay from the company's properties to a new brick manufacturing plant recently constructed.

The All-Metal Screen Co., 710 Ninth Street, Los Angeles, has organized to manufacture screens and similar porducts. H. C. Frisbie, 1244 Gardner Street, heads the company.

The Commercial Acetylene Co., Los Angeles, is having plans prepared for a new plant, 50 x 60 ft., at Slauson and Boyle avenues. W. J. Saunders, Laughlin Building, is the architect.

The Western Furnace & Cornice Works, 202 Brannan Street, San Francisco, has filed plans for a one-story machine shop on West First Street.

The Pacific Gas Radiator Co., Los Angeles, is having plans prepared for a one-story machine and metal working shop at 1738 Cordova Street.

Catalogs Wanted

The Lewis Hall Co., machinery broker and manufacturers' agent, 681 Market Street, San Francisco, desires to purchase machinery for export capable of making daily about 100,000 small brass split rivets and wishes to receive catalogs, prices, etc.

Canada

TORONTO, June 7.

Extensions and improvements will be made to the Hall plant of the Williams Tool Corporation, Brantford, Ont., manufacturer of pipe threading machinery, and considerable new equipment will be installed. A. R. Hall will be manager of the local plant and E. L. Williams will have charge of the local office.

The International Business Machines Co., Toronto, will build a four-story brick and concrete addition, 50 x 125 ft., to its plant on Campbell Avenue. A. H. Harkness is engineer.

The city of Kingston, Ont., will purchase the property of the Cereal Works, and will lease it for 20 years, with the option of buying, to C. A. Eaton, Turner's Falls, Mass., who will establish a plant for the manufacture of cutlery, etc.

The McClary Mfg. Co., London, Ont., which recently took over the plant and business of the William Buck Stove Co., Ltd., Brantford, Ont., will install considerable new equipment in the Brantford plant.

The Moffat Stove Co., Ltd., Weston, Ont., is remodeling its plant and building additions. Considerable new machinery will be purchased and preparations are being made for the installation of electric power equipment.

The Muskoka Quarries, Ltd., Toronto, recently incorporated with a capital stock of $300,000, will establish a plant near Bracebridge, Ont., and install electrically driven equipment. W. B. Tait, 271 Macpherson Avenue, Toronto, is president and general manager.

The Canadian Hart Accumulator Co., St. George Street, St. Johns, Que., will build an addition and install new equipment. C. A. Saville is manager.

The Canadian Radio Corporation, Ltd., Toronto, has been incorporated with a capital stock of $5,000,000 by Sir William McKenzie, Hon. Frederick Nicholls, Abram C. Wisner and others to manufacture electrical machinery, tools, etc.

The W. H. Subling Machinery Co., 7 St. Mary Street, Toronto, is in the market for a 5-hp., 25-cycle, three-phase, 550-volt motor.

The MacLean Underfeed Stoker Co., Ltd., Toronto, has been incorporated with a capital stock of $250,000 by John F. Lucas, James S. Duggan, Craig McKay and others to manufacture machinery, tools, boilers, engines, etc.

The Standard Iron & Lumber Co., 524 St. Ambroise Street, Montreal, has let the general contract for an addition costing $10,000 to Bennett Brothers, 341 Guy Street.

The Canadian Raybestos Co., Bridgeport, Conn., has let the general contract for remodeling a factory building at Peterboro, Ont., at a cost of $18,000.

The Thornbury Electric Lighting Co., Thornbury, Ont., will build an electric plant at a cost of $15,000. Harry Pedwell is chairman.

The Blue-Ray Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Frank J. Hughes, 110 Roxborough Avenue; Leo J. Phelan, 72 Queen Street, West; Charles P. McTague and others as provisional directors, to manufacture machinery, tools, boilers, engines, etc.

The Easy Washing Machine Co., Ltd., Toronto, has been incorporated with a capital stock of $400,000 by Sydney E. Wedd, 85 Bay Street; Roy B. Whitehead, 33 Christie Street; Bruce V. McCrimmon and others.

The Westco Pumps, Ltd., Toronto, has been incorporated with a capital stock of $150,000 by George H. Sedgewick, 36 Toronto Street; John W. Pickup, 255 Glenlake Avenue; James Aitchison and others to manufacture pumps, pumping equipment, tools, etc.

The Carr Fastener Co. of Canada, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $750,000 by Edward H. Ambrose, Henry A. Burbridge, Arthur B. Turner and others to manufacture castings, forgings, machinery, etc.

OFFICE CHANGES

The Reed-Prentice Co., Becker Milling Machine Co. and Whitcomb-Blaisdell Machine Tool Co. opened June 1 at Grand Central Palace, fifth floor, in the International Machinery Exhibition, a direct sales office for handling their sales in the New York territory. The office is under the management of P. K. Dayton, formerly connected with the Niles, Bement, Pond Co. and Manning, Maxwell & Moore. The Cleveland store of these companies has been opened at 408 Frankfort Avenue, in charge of C. A. Severin, formerly of the Cleveland Tool & Supply Co., assisted by Charles Brandhill. These three companies, which are controlled by the same financial interests, have adopted the policy of selling direct to the trade.

The Edward R. Ladew Co., Glen Cove, N. Y., is now located in its offices at 428-430 Broadway, New York, which will be the headquarters of the general sales department, as well as its New York branch. There will be a stockroom and belt shop.

The New York office of the Page Steel & Wire Co. is now located at the Grand Central Terminal Building instead of 30 Church Street.

Wayne Machinery Co., Fort Wayne, Ind., has opened a store at Louisville, Ky., at 121 South Third Street. L. Kenner, for past 11 years associated with Fort Wayne plant (except for years in army service in this country and in France), is in charge. In addition to the Fort Wayne line of rebuilt woodworking and ironworking machinery the Louisville branch handles other wood and metal working equipment.

Stock Dividend Policies of Youngstown Companies

The Brier Hill Steel Co. on April 26 authorized a stock dividend of 20 per cent to distribute 25,000 shares of common remaining in the treasury. Directors also recommended that the common capitalization be increased from $15,000,000 to $50,000,000, to permit an additional stock dividend to be declared that the capital might more nearly conform to actual assets.

At a meeting on April 27, directors of the Youngstown Sheet & Tube Co. declared a stock dividend of 15,034 shares to dispose of the unissued common and recommended that the common stock be increased from $20,000,000 to $100,000,000.

At special stockholders' meetings of both companies on June 1, directors withdrew their recommendations with respect to the capital increases and announced the intention to abandon the plan of issuing common stock dividends because of the 10 per cent tax in the soldiers' bonus bill. It was pointed out the tax would work an undue hardship on stockholders, that the distribution would involve no additional cash outlay and that it would therefore be difficult for many stockholders to pay the tax, which would be an inordinate burden upon them.

A plan of refinancing, which includes the issuance of new common stock of non-par value, was outlined, and this is now being worked out. It involves, first of all, calling in all the outstanding common and issuing new common. It is likely new common will be issued for the old in proportion to the proposed stock dividend.

In both cases the plan of reserving stock for sale to employees on a deferred payment basis will be retained. Directors of the Brier Hill Steel Co. recommended that 30,000 shares be thus reserved, and the Sheet & Tube company will reserve 60,000 shares.

On May 18 the Trumbull Steel Co. at Warren increased its common capital from $14,000,000 to $25,000,000, in anticipation of a common stock distribution. Whether the company will follow out its original intention is questioned. Trumbull company stockholders voted to reserve 20,000 shares for sale to workers.

The Wickwire-Spencer Athletic Council, Wickwire-Spencer Steel Corporation, Worcester, Mass., has leased a former Y. M. C. A. clubhouse on Lake Quinsigamond for the season. The council plans to make alterations calling for an expenditure of between $3,000 and $4,000.

NEW TRADE PUBLICATIONS

Automatic Temperature Control.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Bulletin 857. Deals with apparatus for automatic temperature control, particularly the control of medium and high temperatures in hardening furnaces, drawing furnaces, japanning and enameling ovens, etc. The apparatus includes the use of a thermocouple and an automatic potentiometer. The potentiometer mechanism is arranged to inscribe a record upon a large-scale chart, showing the results of its own regulating action upon the actual temperature of the thermocouple. This system of temperature control was described in THE IRON AGE, issue of May 27.

Pneumatic Safety Valves.—Pneumatic Safety Valve Co., Woonsocket, R. I. Folder. Deals with the construction and operation of pneumatic safety valves for pneumatic rotary machines. It is explained as designed to prevent accidents to machine operators, to increase production results and to reduce injury and breakage to cutting tools.

Thermit Welding.—Metal & Thermit Corporation, 120 Broadway, New York. Pamphlet 30. Gives laboratory experiments with the thermit process of welding. It is intended as a guide for students to acquaint them with the substance, characteristics and results of the thermit reaction.

Ingot Iron Wire.—Page Steel & Wire Co., 30 Church Street, New York. Booklet. Presents in convenient form data and tables pertaining to the properties of American ingot iron wire of interest to engineers, superintendents, purchasing agents and the wire industry in general.

Mechanical Handling of Material.—Gifford Wood Co., Hudson, N. Y. Booklet with the title "Mechanical Handling in All Lines of Industry." Illustrations show various applications of elevating and conveying machinery.

Milling Machines.—Toledo Milling Machine Co., Toledo, Ohio. Catalog. Illustrations and descriptions of the company's vertical milling machines. Deals in detail with the company's No. 3-V high power belt-driven vertical miller.

Belts.—I. B. Williams & Sons, Dover, N. H. Catalog. Presents a line of flat and round belting, rawhide and tanned lace leather, Goodyear welting, etc. Illustrations showing the several departments of the factory are included.

Steel Forms for Roads and Streets.—Blaw-Knox Co., Pittsburgh. Pamphlet. Deals with steel forms used in the construction of concrete roads, brick roads, bituminous roads, curbs, gutters and for concrete pavements and sidewalks.

Leather Products.—Edward R. Ladew Co., Glen Cove, N. Y. Catalog. Devoted to leathers, including belts of various types, automobile leathers, scrap leather, leather packings, mill strapping, heavy machine strapping, protective leathers, foundrymen's safety leggins, etc.

Photographic Lenses.—Bausch & Lomb Optical Co., 611 St. Paul Street, Rochester, N. Y. Catalog with the title "Photographic Lenses." Deals with the various lenses made by this company and shows photographs made with the lenses.

Machinery Guards.—Joshua Horrocks, Inc., 41 Schenectady Avenue, Brooklyn. Catalog. Illustrations and descriptions of guards for machinery, including guards for rip saw, band saw, lathe, calendering machines, grinding machines, circular saws, etc.

Electric Soldering Irons.—Cutler Hammer Mfg. Co., Milwaukee. Folder. Reproductions of advertisements that have been or will be run in various magazines describing electric soldering irons.

Oil Cups.—Charles S. Monson, 2113 Dime Bank Building, Detroit. Folder. Describes the Blooming cup, designed to automatically feed oil to bearings, steering knuckles, shackle bolts, axles and other parts of motor cars, trucks or tractors.

Superheaters for Locomotives.—Locomotive Superheater Co., 30 Church Street, New York. Bulletin 10. Gives results of tests on two engines in switching service, one using superheaters, the other saturated steam.

Milling Machines.—Ingersoll Milling Machine Co., Rockford, Ill. Folder. Concerned with a special milling machine built for milling automobile and tractor front axles.

Vibration Machinery.—Vibration Specialty Co., Philadelphia. Booklet. Describes special machinery for the study and elimination of vibrations in buildings, machinery, structures, etc., and deals with the company's facilities for balancing both in laboratory and in the field, and for the designing of high-speed parts, such as crankshafts, rotors, etc.

Power Transmission Appliances and Elevating and Conveying Machinery.—Fairbanks Co., Broome and Lafayette Streets, New York. Catalog of 256 pages, bound in cloth. Illustrates and describes an extensive line of power transmission appliances and elevating and conveying machinery. Data as to the dimensions, capacities, etc., are included for the man who designs or installs mechanical equipment of this nature.

Drills for Square and Hexagon Holes.—Watts Bros. Tool Works, Turtle Creek, Pa. Catalog 3. Illustrates and describes full floating chucks and drills designed for drilling square and hexagon holes in steel, iron, brass, aluminum, bakelite, wood, etc.

Baling Presses.—K & B Co., 495 North Third Street, Philadelphia. Catalog and circular. Illustrations and descriptions of balers and warehouse equipment with constructive information as to the type of apparatus which is most efficient for each particular kind of work.

Monorail Hoist.—Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. Catalog with the title "The Aerial Railway of Industry." Illustrations describe an electric cage-operated monorail hoist manufactured in a wide range of capacities and forms for the handling of various products. The plans of two typical installations are shown, together with photographs of the machines employed. Each of the several types of hoist recommended are presented, while detail drawings and specifications of parts are given. Switches, trackage and conductor material are also explained and illustrated.

Starting and Lighting Batteries.—Duplex Storage Battery Co., Milwaukee. Catalog A. Deals with starting and lighting batteries for electric vehicles, trucks, x-rays, lighting systems, etc. These batteries use hard rubber plate dividers.

Calendar.—Cooper Hewitt Electric Co., Hoboken, N. J. Consists of 12 pages, 12½ x 18½ in., each bearing a one month's calendar starting with May, 1920, and ending with April, 1921. The upper half of each page bears a half-tone showing application of Cooper Hewitt lighting in various industries.

Tin and Terne Plate.—Viele, Blackwell & Buck, 49 Wall Street, New York. Bulletin 8. Deals with tin and terne plate. The bulletin is published in an endeavor to give foreign traders full particulars on a commodity which, due to its many classifications into sizes, grades, packings, price extras and differentials, has oftentimes been the subject of misunderstandings. An illustrated description of the process of manufacture is included.

Wagon Loaders.—George Haiss Mfg. Co., Canal Place and East 142nd Street, New York. Pamphlet 1420. Descriptions with illustrations of high discharging wagon loaders. A photograph showing the Haiss clam shell bucket excavating for a foundation is included.

Electric Blasting Machine.—Atlas Powder Co., Philadelphia. Folder. Describes the Davis No. 1 blaster, a small lightweight blasting machine.

Hydro-Electric and Steam Power Plants.—Viele, Blackwell & Buck, 49 Wall Street, New York. Bulletin 9. Photographs show engineering and construction work in connection with hydraulic and steam power plants which has been carried out by this company or by its officers individually.

Wagon Loaders for Anthracite Coal.—George Haiss Mfg. Co., 141st Street and Rider Avenue, New York. Bulletin 420. Illustrates and describes the company's wagon-loaders, type S-A, for anthracite coal. These are self-propelled and self-feeding.

Wire Rope and Wire.—John A. Roebling's Sons Co., Trenton, N. J. Booklet, 176 pages, 3½ x 6 in. Illustrates and describes wire rope and wire, also wire rope attachments and accessories. Information on coiling and uncoiling ropes, ordinary wire rope ferry, suspension bridges, cable ways; also tables on the transmission of power by wire rope, the stresses on ropes hauling loads up inclined planes, wire gages, properties of steel and copper wire, sizes and weights, etc., are included.

Metal Caps for Glass Packages.—Phoenix-Hermetic Co., 3720 Fourteenth Avenue, Brooklyn, N. Y. Catalog. Illustrates and describes an extensive line of metal caps for tumblers and jars, and capping machinery.

Grinding Wheels.—Norton Co., Worcester, Mass. Booklet with the title "Norton Grinding Wheels on the Blanchard Surface Grinding Machines." The booklet is intended for men using or interested in the use of Blanchard vertical surface grinding machines as an aid toward getting the best possible results.

Thread Millers.—Smalley-General Co., Bay City, Mich. Pamphlet. Shows views of thread millers installed in customers' plants, also a view of the company's No. 1 flange thread miller with a production estimate. The machines mill internal or external, right or left-hand, straight or tapered threads.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manfacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	5.25c.
Swedish bars, base price	20.00c.
Soft Steel:	
¾ to 1⅞ in., round and square	3.52c. to 5.25c.
1 to 6 in. x ⅜ to 1 in	3.52c. to 5.25c.
1 to 6 in. x ¼ to 5/16	3.62c. to 5.25c.
Rods—⅝ and 11/16	3.57c. to 5.05c.
Bands—1½ to 6 by 3/16 to No. 8	4.22c. to 6.50c.
Hoops	5.57c. to 6.50c.
Shapes:	
Beams and channels—3 to 15 in.	3.47c. to 5.25c.
Angles:	
3 in. x ¼ in. and larger	3.47c. to 5.25c.
3 in. x 3/16 in. and ⅛ in.	3.72c. to 5.60c.
1½ to 2½ in. x ⅛ in.	3.52c. to 5.90c.
1½ to 2¾ in. x 3/16 in. and thicker	3.47c. to 5.85c.
1 to 1¼ in. x 3/16 in.	3.52c. to 5.90c.
1 to 1¼ x ⅛ in.	3.57c. to 5.95c.
⅞ x ⅞ x ⅛ in.	3.62c. to 6.00c.
¾ x ⅛ in.	3.67c. to 6.05c.
⅝ x ⅛ in.	4.07c. to 6.85c.
½ x 3/32 in.	5.17c. to 7.55c.
Tees:	
1 x ⅛ in.	3.87c. to 6.25c.
1¼ in. x 1¼ x 3/16 in.	3.77c. to 6.15c.
1½ to 2½ x 3/16 in. and thicker	3.57c. to 5.95c.
3 in. and larger	3.52c. to 5.30c.

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	5.00c. to 5.25c.
(Smooth finish, 1 x 2½ x ¼ in. and larger)	5.50c.
Toe calk, ½ x ⅜ in. and larger	6.00c.
Cold-rolled strip (soft and quarter hard)	12c. to 14c.
Open-hearth spring steel	7.00c. to 10.00c.
Shafting and Screw Stock:	
Rounds	6.25c. to 7.00c.
Squares, flats and hex	6.75c. to 7.50c.
Standard cast steel, base price	15.00c.
Best cast steel	20.00c. to 24.00c.
Extra best cast steel	25.00 to 30.00c.

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c. to 5.50c.

Sheets

Blue Annealed

	Per lb.
No. 10	7.12c. to 8.00c.
No. 12	7.15c. to 8.05c.
No. 14	7.22c. to 8.10c.
No. 16	8.32c. to 8.20c.

Box Annealed—Black

	Soft Steel C.R., One Pass per lb.	Wood's Refined, per lb.
Nos. 18 to 20	8.30c. to 9.90c.	
Nos. 22 and 24	8.35c. to 9.85c.	10.80c.
No. 26	8.40c. to 9.90c.	10.85c.
No. 28	8.50c. to 10.00c.	11.00c.
No. 30	8.60c. to 10.10c.	

No. 28, 36 in. wide, 10c. higher.

Galvanized

	Per lb.
No. 14	8.75c. to 10.50c.
No. 16	9.00c. to 10.75c.
Nos. 18 and 20	9.15c. to 10.90c.
Nos. 22 and 24	9.30c. to 11.05c.
No. 26	9.45c. to 11.20c.
No. 27	9.60c. to 11.35c.
No. 28	9.75c. to 11.50c.
No. 30	10.25c. to 12.00c.

No. 28, 36 in. wide, 20c. higher.

Pipe

Standard—Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
⅛ in. Butt...	—36	—19	¾-1½ in. Butt.	—15	+ 5
¾-3 in. Butt.	—40	—24	2 in. Lap.....	— 7	+11
3½-6 in. Lap.	—35	—20	2½-6 in. Lap..	— 9	+ 7
7-12 in. Lap..	—25	— 8	7-12 in. Lap...	+ 2	+20

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per lb
Bright basic	8.00c.
Annealed soft	8.00c.
Galvanized annealed	8.50c.
Coppered basic	8.50c.
Tinned soft Bessemer	10.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE	
High Brass Sheet	28¼c. to 29½c.
High Brass Wire	28¼c. to 29½c.
Brass Rod	26¾c. to 29 c.
Brass Tube	42½c. to 44½c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 29½c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	11.80	11.55
		90 lb....	11.90	11.65
		100 lb...	12.00	11.75
IC...$16.50	$14.25	IC...	12.25	12.00
IX... 18.75	16.25	IX...	13.25	13.00
IXX... 20.50	18.00	IXX...	14.25	14.00
IXXX... 22.25	19.75	IXXX...	15.25	15.00
IXXXX... 23.75	21.50	IXXXX...	16.25	16.00

Terne Plates

8-lb. Coating 14x20

100 lb.	$9.35
IC	9.50
IX	10.50
Fire door stock	12.75

Tin

Straits pig	54c.
Bar	60c. to 65c.

Copper

Lake ingot	21c. to 22c.
Electrolytic	20c. to 21c.
Casting	19½c. to 20c.

Spelter and Sheet Zinc

Western spelter	10c. to 11c.
Sheet zinc, No. 9 base, casks	14½c. open 15c.

Lead and Solder*

American pig lead	10c. to 11c.
Bar lead	11c. to 12c.
Solder ½ and ½ guaranteed	40c.
No. 1 solder	37c.
Refined solder	33c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c.
Commercial grade, per lb	50c.

Antimony

Asiatic	11¼c. to 11¾c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.... 35c. to 38c.

Old Metals

The market is sluggish and inquiries scarce. Dealers' buying prices are as follows:

	Cents per lb.
Copper, heavy and crucible	16.00
Copper, heavy and wire	15.25
Copper, light and bottoms	13.75
Brass, heavy	10.25
Brass, light	7.50
Heavy machine composition	15.50
No. 1 yellow brass turnings	9.50
No. 1 red brass or composition turnings	12.25
Lead, heavy	7.00
Lead, tea	5.00
Zinc	5.25